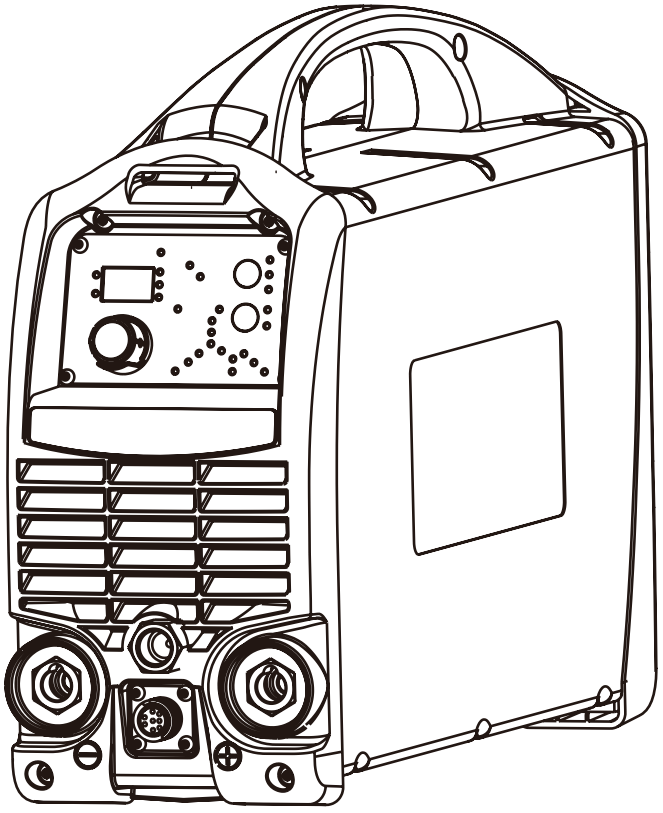
CIGWELD Professional

170Ti

TRANSTIG
WELDING INVERTER



Art # A-11812

Service Manual

Revision: AA **Issue Date:** February 7, 2013 **Manual No.:** 0-5278
Operating Features:

CE

INVERTER | VRD | GTAW | MMAW | 170 AMP | CC | DC | 240 V | 1 PHASE | PFC

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This Service Manual has been designed to instruct you on the correct use and operation of your CIGWELD product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

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Above all, we are committed to develop technologically advanced products to achieve a safer working environment for industry operators.

WARNINGS

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment.

While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use.

Service Manual Number 0-5278 for:
Cigweld Transtig 170Ti Mine Spec Inverter Plant Part Number W1007180
Cigweld Transtig 170Ti Mine Spec Power Source (packed) Part Number W1007179

Published by:
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Publication Date: February 7, 2013

Record the following information for Warranty purposes:

Where Purchased: _____

Purchase Date: _____

Equipment Serial #: _____

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SECTION 1:
ARC WELDING SAFETY INSTRUCTIONS AND WARNINGS

WARNING

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR. DO NOT LOSE THESE INSTRUCTIONS. READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

Welding products and welding processes can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices have developed from past experience in the use of welding and cutting. These practices must be learned through study and training before using this equipment. Some of these practices apply to equipment connected to power lines; other practices apply to engine driven equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld.

Safe practices are outlined in the Australian Standard AS1674.2-2007 entitled: Safety in welding and allied processes Part 2: Electrical. This publication and other guides to what you should learn before operating this equipment are listed at the end of these safety precautions. **HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.**

1.01 Arc Welding Hazards

WARNING

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.
7. Use fully insulated electrode holders. Never dip holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (earth) ground.
11. Do not touch electrode while in contact with the work (ground) circuit.
12. Use only well-maintained equipment. Repair or replace damaged parts at once.
13. In confined spaces or damp locations, do not use a welder with AC output unless it is equipped with a voltage reducer. Use equipment with DC output.
14. Wear a safety harness to prevent falling if working above floor level.
15. Keep all panels and covers securely in place.

WARNING

ARC RAYS can burn eyes and skin; NOISE can damage hearing.

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

1. Use a Welding Helmet or Welding Faceshield fitted with a proper shade of filter (see ANSI Z49.1 and AS 1674 listed in Safety Standards) to protect your face and eyes when welding or watching.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.
6. Never wear contact lenses while welding.

Recommended Protective Filters for Electric Welding		
Description of Process	**Approximate Range of Welding Current in Amps**	**Minimum Shade Number of Filter(s)**
Manual Metal Arc Welding - covered electrodes (MMAW)	Less than or equal to 100	8
	100 to 200	10
	200 to 300	11
	300 to 400	12
	Greater than 400	13
Gas Metal Arc Welding (GWAW) (MIG) other than Aluminium and Stainless Steel	Less than or equal to 150	10
	150 to 250	11
	250 to 300	12
	300 to 400	13
	Greater than 400	14
Gas Metal Arc Welding (GMAW) (MIG) Aluminium and Stainless Steel	Less than or equal to 250	12
	250 to 350	13
Gas Tungsten Arc Welding (GTAW) (TIG)	Less than or equal to 100	10
	100 to 200	11
	200 to 250	12
	250 to 350	13
	Greater than 350	14
Flux-cored Arc Welding (FCAW) -with or without shielding gas.	Less than or equal to 300	11
	300 to 400	12
	400 to 500	13
	Greater than 500	14
Air - Arc Gouging	Less than or equal to 400	12
Plasma - Arc Cutting	50 to 100	10
	100 to 400	12
	400 to 800	14
Plasma - Arc Spraying	—	15
Plasma - Arc Welding	Less than or equal to 20	8
	20 to 100	10
	100 to 400	12
	400 to 800	14
Submerged - Arc Welding	—	2(5)
Resistance Welding	—	Safety Spectacles or eye shield

Refer to standard AS/NZS 1338.1:1992 for comprehensive information regarding the above table.

WARNING

FUMES AND GASES can be hazardous to your health.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WARNING

WELDING can cause fire or explosion.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 10M of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from travelling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

WARNING

FLYING SPARKS AND HOT METAL can cause injury.

Chipping and grinding cause flying metal. As welds cool, they can throw off slag.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

WARNING

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.

5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

WARNING

MOVING PARTS can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.

WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals know to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety code Sec. 25249.5 et seq.)

NOTE

Considerations About Welding And The Effects of Low Frequency Electric and Magnetic Fields

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, Biological Effects of Power Frequency Electric & Magnetic Fields - Background Paper, OTA-BP-E-63 (Washington, DC: U.S. Government Printing Office, May 1989): "...there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields and interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures.

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cable around the body.
4. Keep welding power source and cables as far away from body as practical.

ABOUT PACEMAKERS:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

1.02 Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safety in welding and allied processes Part 1: Fire Precautions, AS 1674.1-1997 from SAI Global Limited, www.saiglobal.com.

Safety in welding and allied processes Part 2: Electrical, AS 1674.2-2007 from SAI Global Limited, www.saiglobal.com.

Filters for eye protectors - Filters for protection against radiation generated in welding and allied operations AS/NZS 1338.1:1992 from SAI Global Limited, www.saiglobal.com.

1.03 Declaration of Conformity

Manufacturer: CIGWELD
Address: 71 Gower St, Preston
Victoria 3072

Australia

Description of equipment: Welding Equipment (GTAW, MMAW) including, but not limited to CIGWELD Transtig 170Ti Welding Inverter and associated accessories.

Serial numbers are unique with each individual piece of equipment and details description, parts used to manufacture a unit and date of manufacture.

The equipment conforms to all applicable aspects and regulations of the 'Low Voltage Directive' (2006/95 EC) and to the National legislation for the enforcement of the Directive.

National Standard and Technical Specifications

The product is designed and manufactured to a number of standards and technical requirements among them are:

- IEC 60974-10 applicable to Industrial Equipment - generic emissions and regulations.
- AS 1674 Safety in welding and allied processes.
- AS 60974.1 / IEC 60974-1 applicable to welding equipment and associated accessories.

Extensive product design verification is conducted at the manufacturing facility as part of the routine design and manufacturing process, to ensure the product is safe and performs as specified. Rigorous testing is incorporated into the manufacturing process to ensure the manufactured product meets or exceeds all design specifications.

CIGWELD has been manufacturing and merchandising an extensive equipment range with superior performance, ultra safe operation and world class quality for more than 30 years and will continue to achieve excellence.

1.04 Servicing Hazards

WARNING

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard.

Only qualified persons should test, maintain, and repair this unit.

Only qualified persons should test, maintain, and repair this unit.

WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source and wire feeder and disconnect and lockout input power using line disconnect switch, circuit breakers, or by removing plug from receptacle, or stop engine before servicing unless the procedure specifically requires an energized unit.
- Insulate yourself from ground by standing or working on dry insulating mats big enough to prevent contact with the ground.
- Do not leave live unit unattended.
- If this procedure requires and energized unit, have only personnel familiar with and following standard safety practices do the job.
- When testing a live unit, use the one-hand method. Do not put both hands inside unit. Keep one hand free.
- Disconnect input power conductors from de-energized supply line BEFORE moving a welding power source.

  SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverters, disconnect input power, and discharge input capacitors according to instructions in Troubleshooting Section before touching any parts.

WARNING

STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

WARNING

FIRE OR EXPLOSION hazard.

- Do not place unit on, over, or near combustible surfaces.
- Do not service unit near flammables.

WARNING

FLYING METAL or DIRT can injure eyes.

- Wear safety glasses with side shields or face shield during servicing.
- Be careful not to short metal tools, parts, or wires together during testing and servicing.

WARNING

HOT PARTS can cause sever burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle not parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

WARNING

EXPLODING PARTS can cause injury.

- Failed parts can explode or cause other parts to explode when power is applied to inverters.
- Always wear a face shield and long sleeves when servicing inverters.

WARNING

SHOCK HAZARD from testing.

- Turn Off welding power source and wire feeder or stop engine before making or changing meter lead connections.
- Use at least one meter lead that has a self-retaining spring clip such as an alligator clip.
- Read instructions for test equipment.

WARNING

FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

WARNING

MOVING PARTS can cause injury,

- Keep away from moving parts such as fans.
- Keep away from pinch points such as drive rolls.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance as necessary.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.

WARNING

OVERUSE can cause OVERHEATING.

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

WARNING

READ INSTRUCTIONS.

- Use Testing Booklet (Part No. 150 853) when servicing this unit.
- Consult the Owner's Manual for welding safety precautions.
- Use only genuine replacement parts from the manufacturer.

1.05 EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

WARNING

H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment install, test, and service H.F. producing units.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

About Implanted Medical Device

WARNING

MAGNETIC FIELDS can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away from servicing areas until consulting their doctor and the device manufacturer.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

Notes

SECTION 2:
INTRODUCTION

2.01 How To Use This Manual

To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.

Throughout this manual, the words WARNING, CAUTION, and NOTE may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

WARNING

A WARNING gives information regarding possible personal injury.

CAUTION

A CAUTION refers to possible equipment damage.

NOTE

A NOTE offers helpful information concerning certain operating procedures.

Additional copies of this manual may be purchased by contacting Cigweld at the address and phone number for your location listed in the inside back cover of this manual. Include the Owner's Manual number and equipment identification numbers.

2.02 Equipment Identification

The unit's identification number (specification or part number), model, and serial number usually appear on a nameplate attached to the control panel. In some cases, the nameplate may be attached to the rear panel. Equipment which does not have a control panel such as gun and cable assemblies is identified only by the specification or part number printed on the shipping container. Record these numbers on the bottom of page i for future reference.

2.03 Receipt Of Equipment

When you receive the equipment, check it against the invoice to make sure it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the location in your area listed in the inside back cover of this manual.

Include all equipment identification numbers as described above along with a full description of the parts in error.

Move the equipment to the installation site before un-crating the unit. Use care to avoid damaging the equipment when using bars, hammers, etc., to uncrate the unit.

2.04 Symbol Chart

Note that only some of these symbols will appear on your model.

	On
	Off
	Dangerous Voltage
	Increase/Decrease
	Circuit Breaker
	AC Auxiliary Power
	Fuse
A	Amperage
V	Voltage
Hz	Hertz (cycles/sec)
f	Frequency
	Negative
	Positive
	Direct Current (DC)
	Protective Earth (Ground)
	Line
	Line Connection
	Auxiliary Power
115V 15A	Receptacle Rating- Auxiliary Power

1 ~	Single Phase
3 ~	Three Phase
	Three Phase Static Frequency Converter-Transformer-Rectifier
	Remote
X	Duty Cycle
%	Percentage
	Panel/Local
	Shielded Metal Arc Welding (SMAW)
	Gas Metal Arc Welding (GMAW)
	Gas Tungsten Arc Welding (GTAW)
	Air Carbon Arc Cutting (CAC-A)
	Constant Current
	Constant Voltage Or Constant Potential
	High Temperature
	Fault Indication
	Arc Force
	Touch Start (GTAW)
	Variable Inductance
V	Voltage Input

	Wire Feed Function
	Wire Feed Towards Workpiece With Output Voltage Off.
	Welding Gun
	Purging Of Gas
	Continuous Weld Mode
	Spot Weld Mode
t	Spot Time
t1	Preflow Time
t2	Postflow Time
	2 Step Trigger Operation Press to initiate wirefeed and welding, release to stop.
	4 Step Trigger Operation Press and hold for preflow, release to start arc. Press to stop arc, and hold for preflow.
t	Burnback Time
	Disturbance In Ground System
IPM	Inches Per Minute
MPM	Meters Per Minute

Art # A-04937

2.05 Description

The Cigweld Transtig 170Ti is a self contained single phase multi process welding inverter that is capable of performing MMAW (Stick) and GTAW (HF and Lift TIG) welding processes. The unit is equipped with an integrated voltage reduction device (VRD applicable in stick mode only), digital amperage/voltage meter, and a host of other features in order to fully satisfy the broad operating needs of the modern welding professional. The unit is also fully compliant to Australian Standard AS 60974.1 and IEC 60974.1.

The Transtig 170Ti provides excellent welding performance across a broad range of applications when used with the correct welding consumables and procedures. The following instructions detail how to correctly and safely set up the machine and give guidelines on gaining the best efficiency and quality from the Power Source. Please read these instructions thoroughly before using the unit.

2.06 User Responsibility

This equipment will perform as per the information contained herein when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Defective equipment (including welding leads) should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated, should be replaced immediately. Should such repairs or replacements become necessary, it is recommended that such repairs be carried out by appropriately qualified persons approved by CIGWELD. Advice in this regard can be obtained by contacting an Accredited CIGWELD Distributor.

This equipment or any of its parts should not be altered from standard specification without prior written approval of CIGWELD. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use or unauthorized modification from standard specification, faulty maintenance, damage or improper repair by anyone other than appropriately qualified persons approved by CIGWELD.

2.07 Transporting Methods

This unit is equipped with a handle for carrying purposes.

WARNING

ELECTRIC SHOCK can kill. DO NOT TOUCH live electrical parts. Disconnect input power conductors from de-energized supply line before moving the welding power source.

WARNING

FALLING EQUIPMENT can cause serious personal injury and equipment damage.

Lift unit with handle on top of case.

Use handcart or similar device of adequate capacity.

If using a fork lift vehicle, place and secure unit on a proper skid before transporting.

2.08 Packaged Items

Transtig 170Ti Mine Spec Plant (Part No. W1007180)

- Transtig 170Ti Mine Spec Inverter Power Source
- Handipak of electrodes, Satincraft 13
- Comet Professional Argon Regulator/Flowmeter
- Tig Torch type 26 with flex head, trigger switch and 8 pin remote control connection
- Tig Torch Accessory kit that includes 1.6mm and 2.4mm tungstens with collets, collet bodies and No. 4, 5 & 6 Alumina Nozzles
- Electrode Holder with 4m Lead
- Work Clamp with 4m Lead
- Shielding Gas Hose Assembly
- Shoulder Strap
- Product Bag
- Operating Manual

Transtig 170Ti Mine Spec Power Source (Part No. W1007179)

- Transtig 170Ti Mine Spec Inverter Power Source
- Shielding Gas Hose Assembly
- Shoulder Strap
- Operating Manual

Notes

SECTION 3:
INSTALLATION

3.01 Duty Cycle

The rated duty cycle of a Welding Power Source, is a statement of the time it may be operated at its rated welding current output without exceeding the temperature limits of the insulation of the component parts. To explain the 10 minute duty cycle period the following example is used. Suppose a Welding Power Source is designed to operate at a 30% duty cycle, 170 amperes at 26.8 volts. This means that it has been designed and built to provide the rated amperage (170A) for 3.0 minutes, i.e. arc welding time, out of every 10 minute period (30% of 10 minutes is 3.0 minutes). During the other 7.0 minutes of the 10 minute period the Welding Power Source must idle and be allowed to cool.

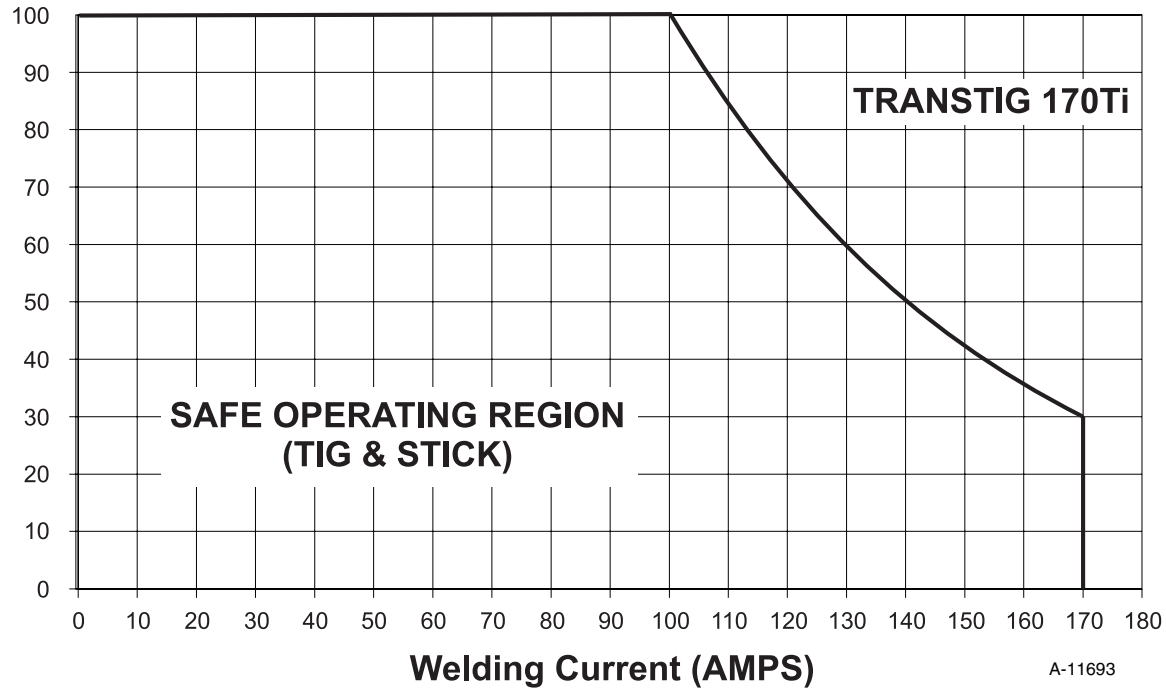


Figure 3-1: Transtig 170Ti Duty Cycle

3.02 Specifications

Description	Transtig 170Ti
Plant Part No	W1007180
Power Source Part No	W1007179
Power Source Dimensions	H324mmxW122mmxD458mm
Power Source Mass	11.5 KG
Cooling	Fan Cooled
Welder Type	Multi Process Inverter Power Source
Australian Standard	AS 60974.1-2006 / IEC 60974.1
Number of Phases	Single Phase
Nominal Supply Voltage	240V ± 15%
Nominal Supply Frequency	50/60Hz
Welding Current Range	5-170A
Nominal DC Open Circuit Voltage (VRD ON)	8V
Nominal DC Open Circuit Voltage (VRD OFF)	66V
Factory Fitted Supply Plug Rating	15 Amps
Effective Input Current (I_{1eff}) refer Note 2	13 Amps
Maximum Input Current (I_{1max})	23.5 Amps
Minimum Single Phase Generator Recommendation (refer Note 4)	6.6k W (8.5k VA at 0.8 PF)
STICK (MMAW) Welding Output, 40ºC, 10 min.	170A @ 30%, 26.8V 130A @ 60%, 25.2V 100A @ 100%, 24.0V
TIG (GTAW) Welding Output, 40ºC, 10 min.	170A @ 30%, 16.8V 130A @ 60%, 15.2V 100A @ 100%, 14.0V
Protection Class	IP23S

Table 3-1: Transtig 170Ti Specifications

NOTE 1

Due to variations that can occur in manufactured products, claimed performance, voltages, ratings, all capacities, measurements, dimensions and weights quoted are approximate only. Achievable capacities and ratings in use and operation will depend upon correct installation, use, applications, maintenance and service.

NOTE 2

The Effective Input Current should be used for the determination of cable size & supply requirements.

NOTE 3

Motor start fuses or thermal circuit breakers are recommended for this application. Check local requirements for your situation in this regard.

NOTE 4

Minimum Generator Recommendation at the Maximum Output Duty Cycle.

Due to large variations in performance and specifications of different brands and types of generators, Cigweld cannot guarantee full welding output power or duty cycle on every brand or type of generator.

Some small generators incorporate low cost circuit breakers on their outputs. These circuit breakers usually will have a small reset button, and will trip much faster than a switchboard type circuit breaker. This may result in not being able to achieve full output or duty cycle from the power source / generator combination. For this reason we recommend a generator that incorporates switchboard type circuit breakers.

Cigweld recommends that when selecting a generator, that the particular power source / generator combination be adequately trialled to ensure the combination performs to the users expectations.

NOTE 5

CIGWELD reserves the right to change product performance and specifications without notice.

3.03 Environment

These units are designed for use in environments with increased hazard of electric shock as outlined in AS 60974.1 and AS 1674.2.

A. Examples of environments with increased hazard of electric shock are:

   1. In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts.
   2. In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator.
   3. In wet or damp hot locations where humidity or perspiration considerable reduces the skin resistance of the human body and the insulation properties of accessories.

B. Environments with increased hazard of electric shock do not include places where electrically conductive parts have been insulated.

3.04 Location

Be sure to locate the welder according to the following guidelines:

A. In areas, free from moisture and dust.

B. Ambient temperature between 0° C to 40° C.

C. In areas, free from oil, steam and corrosive gases.

D. In areas, not subjected to abnormal vibration or shock.

E. In areas, not exposed to direct sunlight or rain.

F. Place at a distance of 300mm or more from walls or similar that could restrict natural air flow for cooling.

G. The enclosure design of this power source meets the requirements of IP23S as outlined in AS60529. This provides adequate protection against solid objects (greater than 12mm), and direct protection from vertical drops. Under no circumstances should the unit be operated or connected in a micro environment that will exceed the stated conditions. For further information please refer to AS 60529.

H. Precautions must be taken against the power source toppling over. The power source must be located on a suitable horizontal surface in the upright position when in use.

3.05 Ventilation

Since the inhalation of welding fumes can be harmful, ensure that the welding area is effectively ventilated.

3.06 Mains Supply Voltage Requirements

The Mains supply voltage should be within ± 15% of the rated mains supply voltage. Too low a voltage may cause poor welding performance. Too high a supply voltage will cause components to overheat and possibly fail.

The Welding Power Source must be:

- Correctly installed, if necessary, by a qualified electrician.
- Correctly earthed (electrically) in accordance with local regulations.
- Connected to the correct size power point and fuse as per the Specifications on page 2-5.

WARNING

Any electrical work must be carried out by a qualified Electrical Tradesperson.

3.07 Electromagnetic Compatibility

WARNING

Extra precautions for Electromagnetic Compatibility may be required when this Welding Power Source is used in a domestic situation.

A. Installation and Use - Users Responsibility

The user is responsible for installing and using the welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the user of the welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the welding circuit, see NOTE below. In other cases it could involve constructing an electromagnetic screen enclosing the Welding Power Source and the work, complete with associated input filters. In all cases, electromagnetic disturbances shall be reduced to the point where they are no longer troublesome.

NOTE

The welding circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorised by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding current return paths which may damage the earth circuits of other equipment. Further guidance is given in IEC 60974-13 Arc Welding Equipment - Installation and use (under preparation).

B. Assessment of Area

Before installing welding equipment, the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account

1. Other supply cables, control cables, signalling and telephone cables; above, below and adjacent to the welding equipment.
2. Radio and television transmitters and receivers.
3. Computer and other control equipment.
4. Safety critical equipment, e.g. guarding of industrial equipment.
5. The health of people around, e.g. the use of pacemakers and hearing aids.
6. Equipment used for calibration and measurement.
7. The time of day that welding or other activities are to be carried out.
8. The compatibility of other equipment in the environment: the user shall ensure that other equipment being used in the environment is compatible: this may require additional protection measures.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

C. Methods of Reducing Electromagnetic Emissions

1. Mains Supply

   Welding equipment should be connected to the mains supply according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout it's length. The shielding should be connected to the Welding Power Source so that good electrical contact is maintained between the conduit and the Welding Power Source enclosure.

2. Maintenance of Welding Equipment

   The welding equipment should be routinely maintained according to the manufacturer's recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in the manufacturer's instructions. In particular, the spark gaps of arc striking and stabilising devices should be adjusted and maintained according to the manufacturer's recommendations.

3. Welding Cables

   The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

4. Equipotential Bonding

   Bonding of all metallic components in the welding installation and adjacent to it should be considered. However. Metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching the metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

5. Earthing of the Workpiece

   Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of it's size and position, e.g. ship's hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

6. Screening and Shielding

   Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening the entire welding installation may be considered for special applications.

Notes

SECTION 4:
OPERATION

4.01 Transtig 170Ti Power Source Controls, Indicators and Features

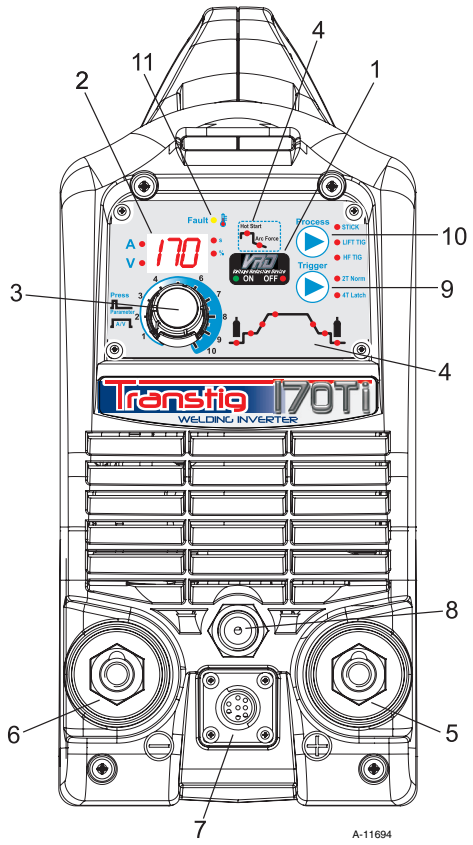


Figure 4-1: Front Panel

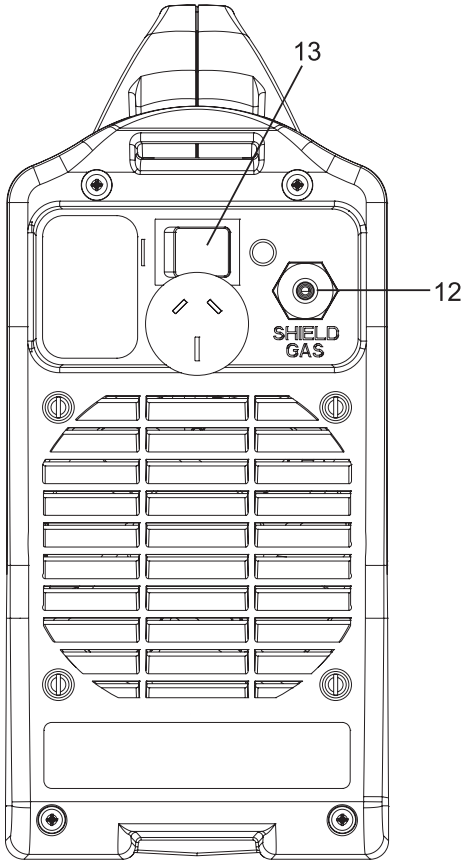


Figure 4-2: Rear Panel

1. VRD ON/OFF Indicator Lights

A VRD (voltage reduction device) is a hazard reducing device designed to reduce electric shock hazards present on the output of welding power source when operating in MMAW (stick) mode. Note that the presence of VRD should not be used as a substitute for the use of appropriate safety practices as indicated in section one of this manual.

Both the green and red indicator lights only operate in MMAW (stick) mode.

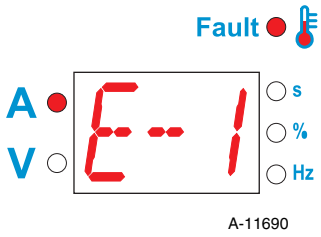
The green VRD ON light illuminates (red light is off) when the VRD is active. Under this condition the open circuit voltage of the unit is limited to below 10V DC, thus reducing the potential of serious electric shock (such as when changing electrodes).

The red VRD OFF light illuminates (green light is off) when the VRD is inactive. Under this condition the output voltage of the unit will be at welding potential which in some cases may exceed 25V DC.

Fail to safe operation

This welding power source is also protected by a special protection feature called “Fail to Safe Operation” which is available in this model. The output of the power source will be disabled and the fault indicator will illuminate if the “Fail to Safe” protection has operated. The “Fail to Safe” protection will not automatically reset. The mains power switch must be turned off to reset the power source.

The display will also show error code E-1 if the “Fail to Safe” protection has operated.



A-11690

2. Digital Meter (Amps and Volts)

The digital meter is used to display the pre-set parameter values (when not welding) and actual output current or voltage (when welding) of the power source. A long press (>2s) on the Multi Function Control toggles between the display of amps and volts.

If you are in "amps display" mode, when not welding, long press of more than 2 seconds on the Multi Function Control will set the 170Ti to "volts display" mode, the meter will show actual output volts for 5 seconds, then revert to "amps display" and allows adjustment of parameters. During welding, the meter will show actual welding volts when selected.

If you are in "volts display" mode, when not welding, long press of more than 2 seconds on the Multi Function Control will set the 170Ti to "amps display" and allows adjustment of parameters. During welding, the meter will show actual welding amps when selected.

At the completion of welding, the meter will hold the last recorded value for a period of approximately 10 seconds. During the hold time the display will flash to indicate the hold function is active. The meter will hold the value until; (1) the Multi Function Control is adjusted in which case the unit will revert to preview mode, (2) welding is recommenced, in which case actual welding amperage or voltage will be displayed, or (3) a period of 10 seconds elapses following the completion of welding in which case the unit will return to preview mode. The value displayed in preview mode and welding mode is steady (not flashing).

3. Multi Function Control

When not welding, the Multi Function Control is used to adjust all welding parameters, including welding amps. A short press on the Multi Function Control will save the parameter value, then increment to the next available parameter. The parameter LED will illuminate and the Multi Function Control will then adjust the parameter. The parameter value is shown on the meter (figure 4-1, Item 2) and the LED's next to the meter indicate if the parameter is Amps, Seconds, %, or Hz. Another press on the Multi Function Control will save the parameter value, then increment to the next available parameter. During welding, adjustment of the Multi Function Control will adjust the actual welding amps, no other parameters are adjustable during welding.

4. Parameter LED's (Weld Activity LED's)

When welding, the weld activity graph LED's will illuminate to indicate which weld sequence step is currently active. When not welding, the parameter LED will illuminate to show which parameter is currently being adjusted. In MMAW (Stick) mode, the adjustable parameters are weld current, hot start current & arc force. In GTAW (Lift Tig) mode, the adjustable parameters are initial current, up slope time, weld current, down slope time, crater current, post flow. In GTAW (HF Tig) mode, the adjustable parameters are pre flow, initial current, up slope time, weld current, down slope time, crater current, post flow.

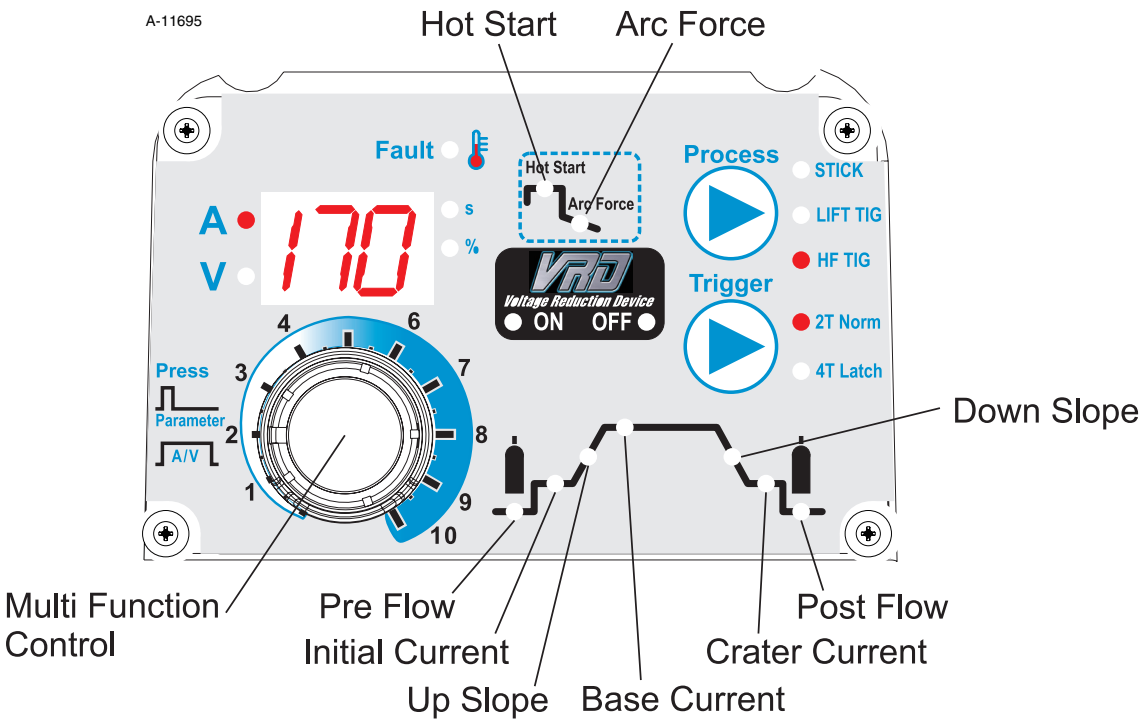
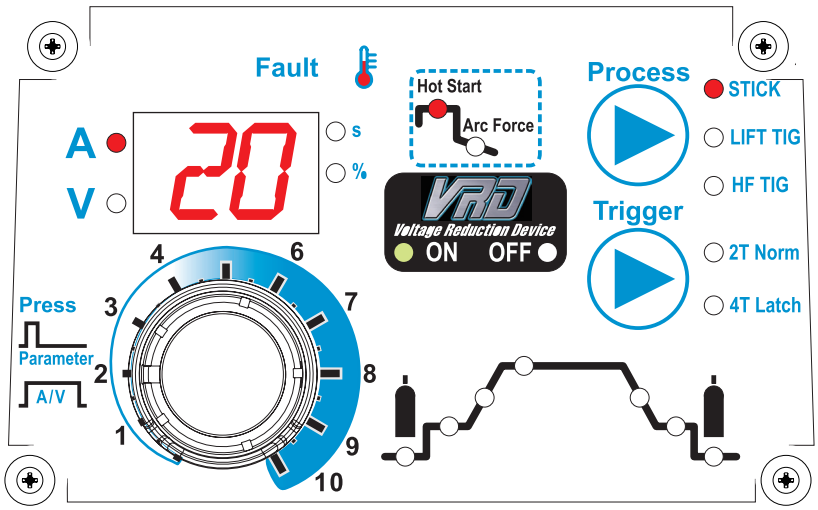
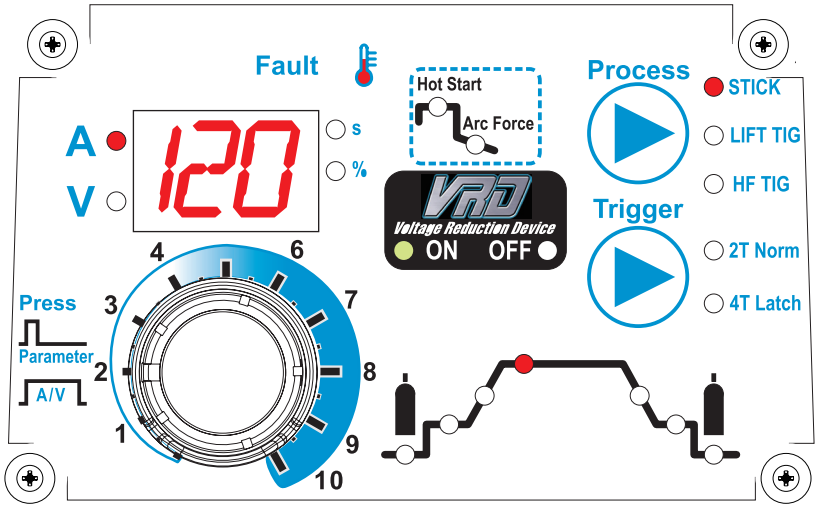
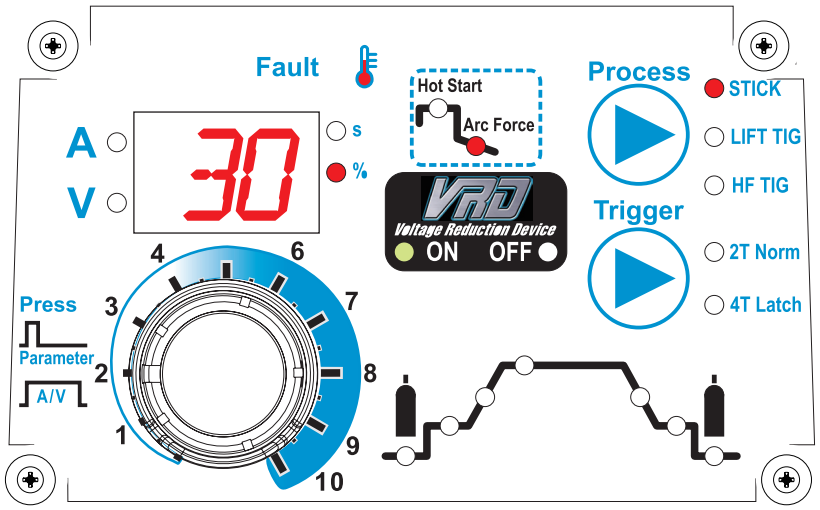


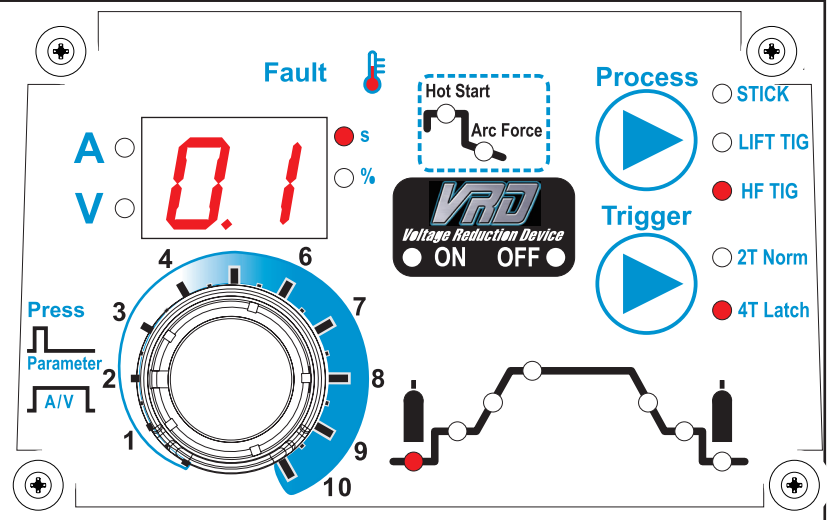
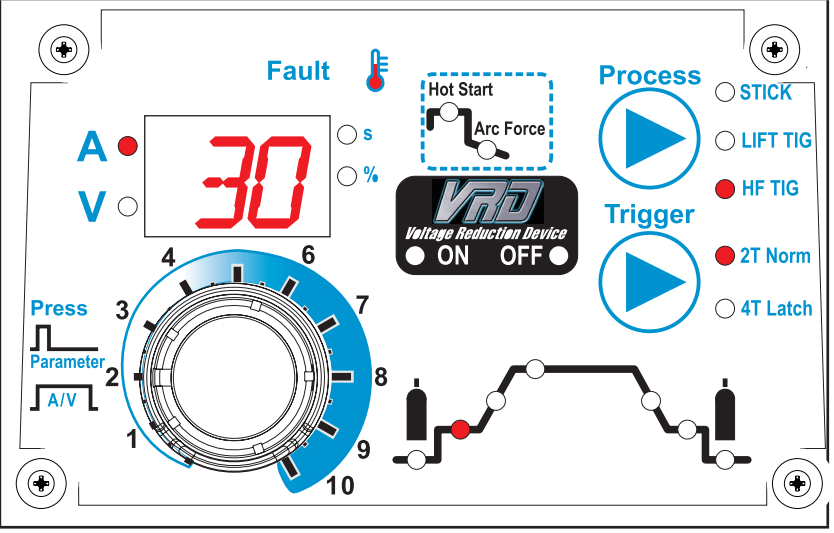
Figure 4-3: Programming Mode

STICK Programming Mode

Programming Parameter	Control Panel Display
Hot Start This parameter operates in STICK mode to improve the start characteristics for stick electrodes HOT START current is on top of the BASE current. e.g. HOT START current = 130 amps when BASE (WELD) = 100 amps & HOT START = 30 amps Range is 0 to 70A. Factory default is 20A. Note that maximum weld current is 170A.	
Base Current This parameter sets the STICK weld current. Range is 5 to 170A. Factory default is 120A.	

Programming Parameter	Control Panel Display
Arc Force Arc Force is effective when in STICK mode only. Arc Force control provides an adjustable amount of Arc Force (or "dig") control. This feature can be particularly beneficial in providing the operator the ability to compensate for variability in joint fit-up in certain situations with particular electrodes. In general increasing the Arc Force control toward 100% (maximum Arc Force) allows greater penetration control to be achieved. Range is 0 to 100%. Factory default is 30%.	

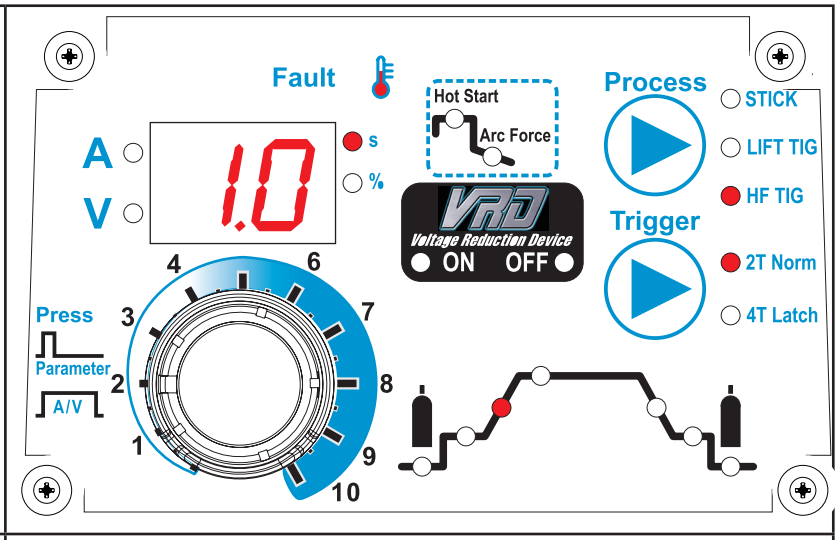
LIFT TIG and HF TIG Programming Mode

Programming Parameter	Control Panel Display
Pre Flow This parameter operates in 2T and 4T HF TIG mode only and is used to provide gas to the weld zone prior to striking the arc, once the torch trigger switch has been pressed. This control is used to dramatically reduce weld porosity at the start of a weld. Range is 0.0 to 5.0 seconds. Factory default is 0.1 second.	
Initial Current This parameter operates in TIG modes only and is used to set the start current for TIG. In 4T mode the Initial Current remains on until the torch trigger switch is released after it has been depressed. In 2T mode this is the Initial Current for the Up Slope current ramp. Range is 5 to 170A. Factory default is 30A.	

Up Slope

This parameter operates in TIG modes only and is used to set the time for the weld current to ramp up from INITIAL current to BASE current.

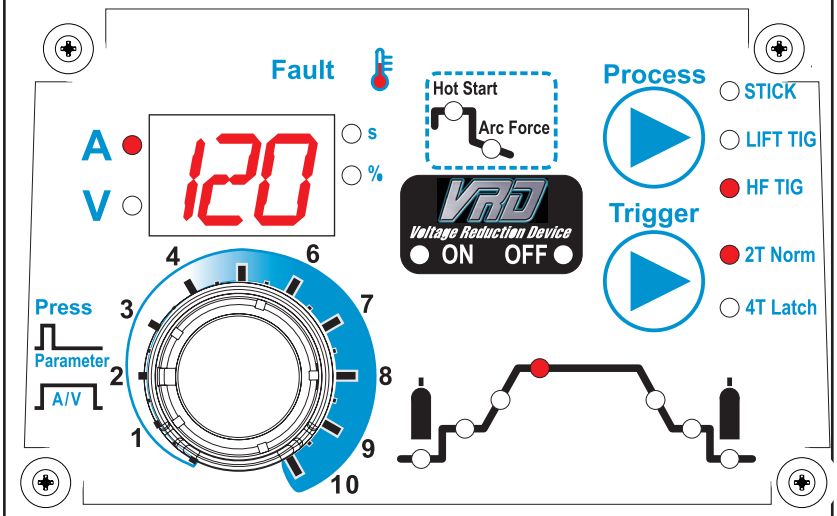
Range is 0.0 to 15.0 seconds. Factory default is 1.0 second.



Base Current

This parameter sets the TIG welding current.

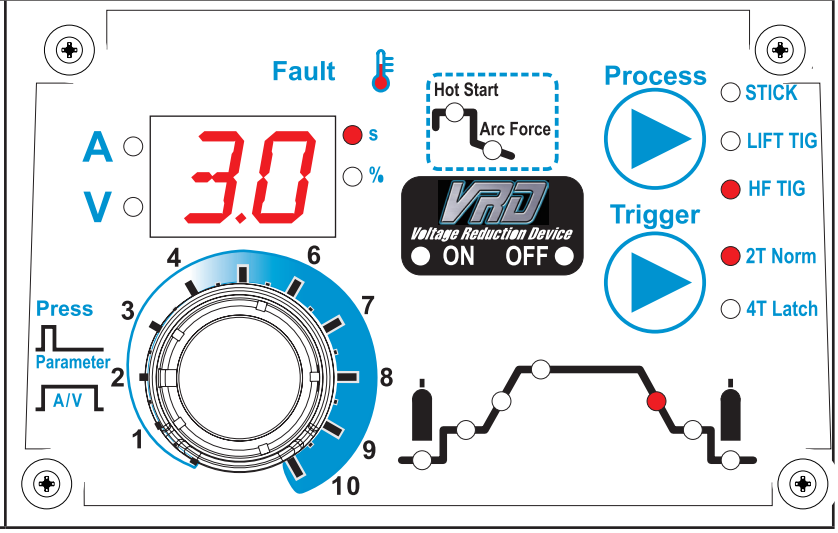
Range is 5 to 170A. Factory default is 120A.



Down Slope

This parameter operates in TIG modes only and is used to set the time for the weld current to ramp down to the crater current. This control is used to eliminate the crater that can form at the completion of a weld.

Range is 0.0 to 25.0 seconds. Factory default is 3.0 seconds.



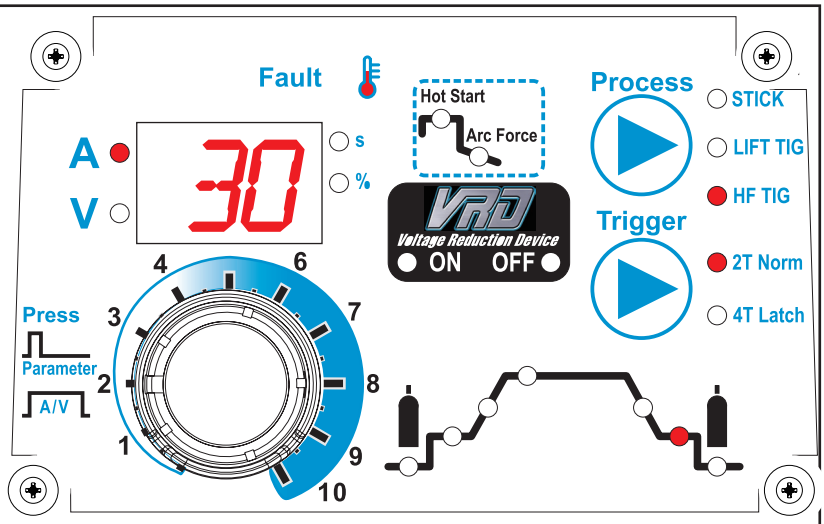
Crater Current

This parameter operates in TIG modes only.

In 2T mode this is the current at the end of the down slope current ramp. When the welding current reaches the Crater Current value, the welding current will cease and the unit will enter Post Flow mode.

In 4T mode, this is the current at the end of the down slope current ramp. The welding current will remain at the Crater Current value until the torch trigger is released, at which time the welding current will cease and the unit will enter Post Flow mode.

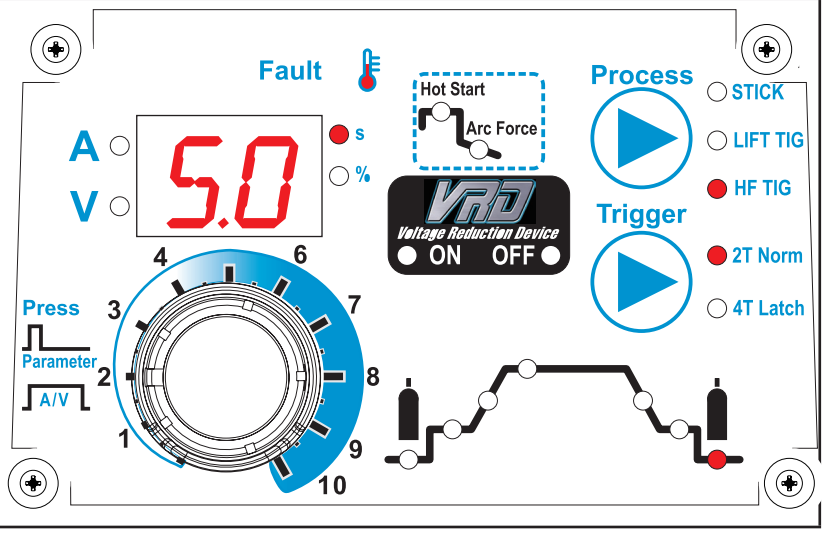
Range is 5 to 170A. Factory default is 30A.



Post Flow

This parameter operates in TIG modes only and is used to adjust the post gas flow time once the arc has extinguished. This control is used to dramatically reduce oxidation of the tungsten electrode.

Range is 0.0 to 30.0 seconds. Factory default is 5.0 seconds.



5. Positive Welding Output Terminal

The positive welding terminal is used to connect the welding output of the power source to the electrode holder lead or work lead. Positive welding current flows from the power source via this heavy duty bayonet type terminal. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the bayonet terminal.

6. Negative Welding Output Terminal

The negative welding terminal is used to connect the welding output of the power source to the TIG torch or work lead. Negative welding current flows to the power source via this heavy duty bayonet type terminal. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the bayonet terminal.

7. Remote Control Socket

The 8 pin Remote Control Socket is used to connect remote control devices to the welding power source. To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise.

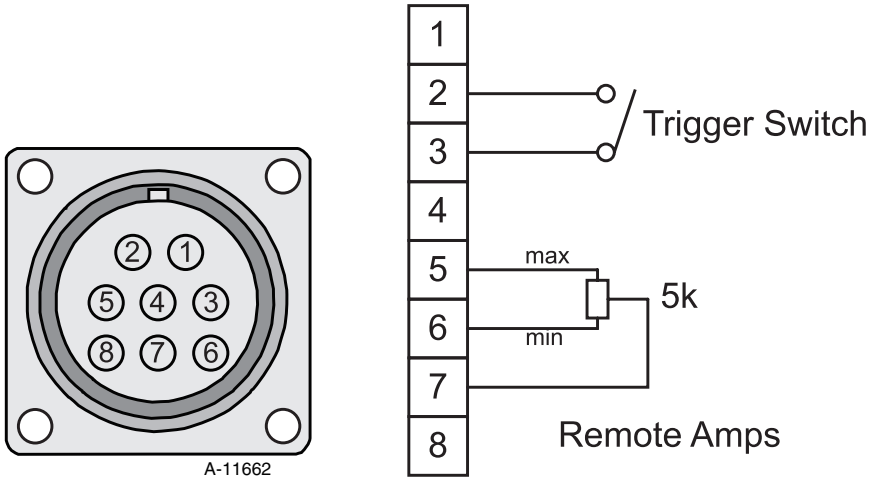


Figure 4-4: Remote Control Socket

Socket Pin	Function
1	Not connected
2	Trigger Switch Input
3	Trigger Switch Input
4	Not connected
5	5k ohm (maximum) connection to 5k ohm remote control potentiometer.
6	Zero ohm (minimum) connection to 5k ohm remote control potentiometer.
7	Wiper arm connection to 5k ohm remote control Amps GTAW (TIG) mode potentiometer.
8	Not connected.

Table 4-1

8. Shielding Gas Outlet

The Shielding Gas Outlet located on the front panel is a 5/8-18 UNF female gas fitting and is utilised for the connection of a suitable TIG Torch.

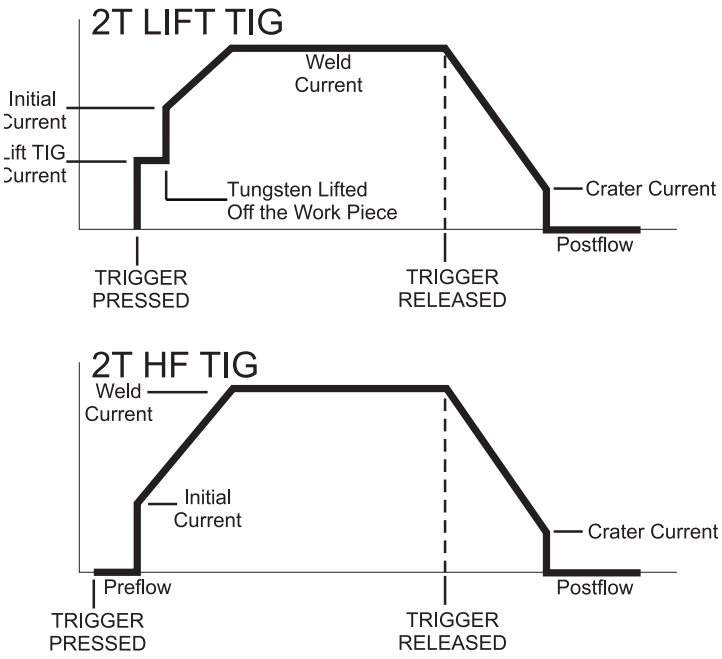
9. Trigger Mode Control

The trigger mode control is used to switch the functionality of the of the torch trigger between 2T (normal) and 4T (latch mode)

2T Normal Mode

In this mode, the torch trigger must remain depressed for the welding output to be active. Press and hold the torch trigger to activate the power source (weld). Release the torch trigger switch to cease welding.

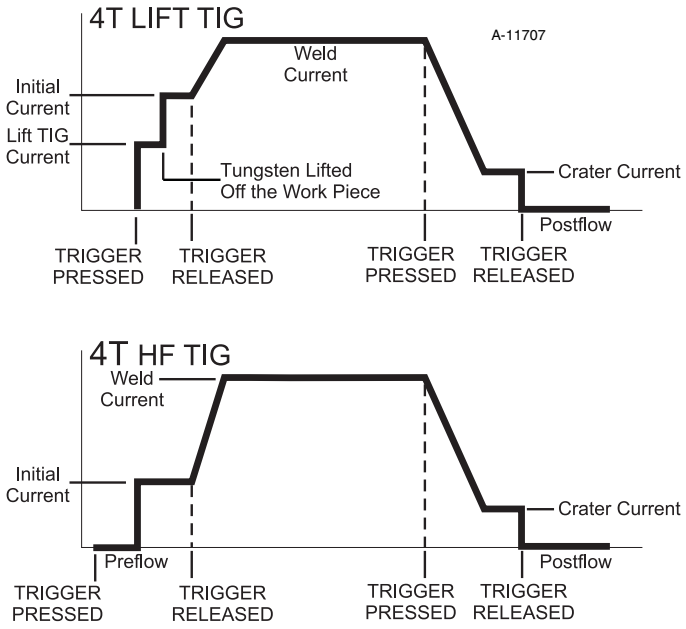
Note that pressing the Trigger Mode Button while turning the mains power on will perform a factory reset.



4T Latch Mode

This mode of welding is mainly used for long welding runs to reduce operator fatigue. In this mode the operator can press and release the torch trigger and the output will remain active. To deactivate the power source, the trigger switch must again be depressed and released, thus eliminating the need for the operator to hold the torch trigger.

Note that when operating in GTAW (TIG mode), the power source will remain activated until the selected downslope time has elapsed.



STICK Dead Man Switch Mode

A special trigger mode called “Dead Man Switch” mode is available on the 170Ti when welding with STICK electrodes. In this mode, there will be no output voltage at all from the Power Source until the trigger is pressed. This provides the greatest level of safety for the operator, and is mandatory on some work sites.

While the Dead Man Switch function greatly increases operator safety, standard welding safety procedures should still be followed.

When the trigger is pressed, the VRD voltage is activated and the user can start welding as normal. For extra safety, if welding has not commenced within 3 seconds after the trigger is pressed, the Power Source will turn off the VRD, and the trigger must be released & pressed again to start welding.

If the trigger is released during welding, all welding power is shut off within the time limits of normal VRD operation.

A special STICK electrode holder is required for use with a Power Source fitted with a Trigger Switch function. This electrode holder has a trigger switch attached to it, and a control cable that connects to the remote control socket of the Power Source. The 170Ti plant comes standard with one of these special electrode holders fitted with an integrated trigger switch.

The Dead Man Switch function is active in both 2T and 4T STICK mode.

Welding with the Dead Man Switch is as follows:

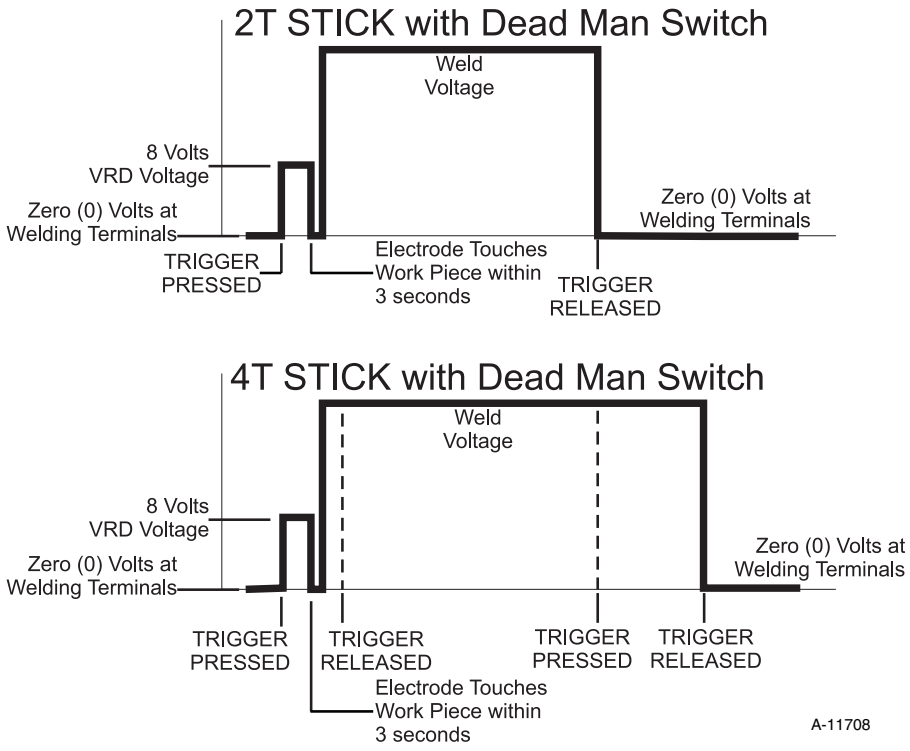
2T MODE

1. Press the trigger on the electrode holder.
2. The Power Source will now output the VRD volts and the VRD ON led will be lit.
3. Touch the Stick Electrode to the work and commence welding as usual.
4. Release the trigger to cease welding.

There will be 0V on the Power Source welding terminals and both VRD lights will be off.

4T MODE

1. Press the trigger on the electrode holder.
2. The Power Source will now output the VRD volts and the VRD ON led will be lit.
3. Touch the Stick Electrode to the work and commence welding as usual.
4. Release the trigger and continue welding.
5. Press and release the trigger to cease welding.



There will be 0V on the Power Source welding terminals and both VRD lights will be off.

In both 2T and 4T modes, if the stick electrode is not touched to the work piece within three seconds, the welding output will be inhibited. Release the trigger to reset, and press the trigger again to reactivate the VRD.

Note that if the Dead Man Switch function is disabled, 2T and 4T are not available in STICK mode.

Information on how to disable the Dead Man Switch function is available from Cigweld Technical Customer Care on +61 3 9474 7400

WARNING

Approval from a mine site manager, or work site manager must be obtained in writing before the Dead Man Switch function is disabled. Only a suitably qualified electrical tradesperson or Cigweld Service Provider should make any changes to the Power Source.

WARNING

The Power Source must be turned off and unplugged from the mains supply before the Dead Man Switch function is changed

WARNING

If 4T operation is selected when using the Dead Man Switch mode, the use of an observer is recommended.

10. Process Selection Control

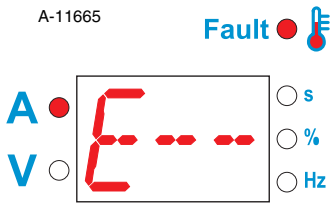
The process selection control is used to select the desired welding mode. Three modes are available, GTAW (HF TIG), GTAW (Lift TIG) and (MMAW (Stick) modes. Refer to section 4.03 for GTAW (TIG) set-up details or section 4.05 for MMAW (stick) set-up details.

Note that when the unit is powered on the mode selection control will automatically default to LIFT TIG/HF TIG mode. This is necessary so as to prevent inadvertent arcing should an electrode holder be connected to the unit and mistakenly be in contact with the work piece during power up.

11. Thermal Overload Indicator

his welding power source is protected by a self resetting thermostat. The indicator will illuminate if the duty cycle of the power source has been exceeded. Should the thermal overload indicator illuminate the output of the power source will be disabled. Once the power source cools down this light will go OFF and the over temperature condition will automatically reset. Note that the mains power switch should remain in the on position such that the fan continues to operate thus allowing the unit to cool sufficiently. Do not switch the unit off should a thermal overload condition be present.

The display will also show error code E-- in the event of an over current or over temperature.



12. Shielding Gas Inlet

The Shield Gas Inlet connection is used to supply the appropriate shielding gas to the unit. Refer to section 4.03 for GTAW (TIG) set up details.

WARNING

Only Inert Shielding Gases specifically designed for welding applications should be used.

13. On / Off Switch

This switch is used to turn the unit on/off.

14. Fan on Demand

The Transtig 170Ti is fitted with a fan on demand feature. Fan on demand automatically switches the cooling fan off when it is not required. This has two main advantages; (1) to minimize power consumption, and (2) to minimize the amount of contaminants such as dust that are drawn into the power source.

Note that the fan will only operate when required for cooling purposes and will automatically switch off when not required.

4.02 Shielding Gas Regulator Operating Instructions

WARNING

This equipment is designed for use with welding grade (Inert) shielding gases only.

Shielding Gas Regulator Safety

This regulator is designed to reduce and control high pressure gas from a cylinder or pipeline to the working pressure required for the equipment using it.

If the equipment is improperly used, hazardous conditions are created that may cause accidents. It is the users responsibility to prevent such conditions. Before handing or using the equipment, understand and comply at all times with the safe practices prescribed in this instruction.

SPECIFIC PROCEDURES for the use of regulators are listed below.

1. NEVER subject the regulator to inlet pressure greater than its rated inlet pressure.
2. NEVER pressurize a regulator that has loose or damaged parts or is in a questionable condition. NEVER loosen a connection or attempt to remove any part of a regulator until the gas pressure has been relieved. Under pressure, gas can dangerously propel a loose part.
3. DO NOT remove the regulator from a cylinder without first closing the cylinder valve and releasing gas in the regulator high and low pressure chambers.
4. DO NOT use the regulator as a control valve. When downstream equipment is not in use for extended periods of time, shut off the gas at the cylinder valve and release the gas from the equipment.
5. OPEN the cylinder valve SLOWLY. Close after use.

User Responsibilities

This equipment will perform safely and reliable only when installed, operated and maintained, and repaired in accordance with the instructions provided. Equipment must be checked periodically and repaired, replaced, or reset as necessary for continued safe and reliable performance. Defective equipment should not be used. Parts that are broken, missing, obviously worn, distorted, or contaminated should be replaced immediately.

The user of this equipment will generally have the sole responsibility for any malfunction, which results from improper use, faulty maintenance, or by repair by anyone other than an accredited repairer.

CAUTION

Match regulator to cylinder. NEVER CONNECT a regulator designed for a particular gas or gases to a cylinder containing any other gas.

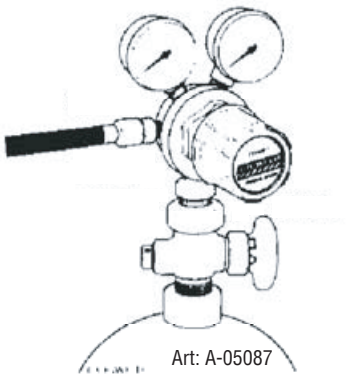


Figure 4-5: Fit Regulator to Cylinder

Installation

1. Remove cylinder valve plastic dust seal. Clean the cylinder valve outlet of impurities that may clog orifices and damage seats before connecting the regulator.

   Crack the valve (open then close) momentarily, pointing the outlet away from people and sources of ignition. Wipe with a clean lint free cloth.

2. Match regulator to cylinder. Before connecting, check that the regulator label and cylinder marking agree and that the regulator inlet and cylinder outlet match. NEVER CONNECT a regulator designed for a particular gas or gases to a cylinder containing any other gas.

3. Connect the regulator inlet connection to cylinder or pipeline and tighten it firmly but not excessively, with a suitable spanner.

4. Connect and tighten the outlet hose firmly and attach down-stream equipment.

5. To protect sensitive down-stream equipment a separate safety device may be necessary if the regulator is not fitted with a pressure relief device.

Operation

With the regulator connected to cylinder or pipeline, and the adjustment screw/knob fully disengaged, pressurize as follows:

1. Stand to one side of regulator and slowly open the cylinder valve. If opened quickly, a sudden pressure surge may damage internal regulator parts.

2. With valves on downstream equipment closed, adjust regulator to approximate working pressure. It is recommended that testing for leaks at the regulator connection points be carried out using a suitable leak detection solution or soapy water.

3. Purge air or other unwanted welding grade shielding gas from equipment connected to the regulator by individually opening then closing the equipment control valves. Complete purging may take up to ten seconds or more, depending upon the length and size of the hose being purged.

Adjusting Flow Rate

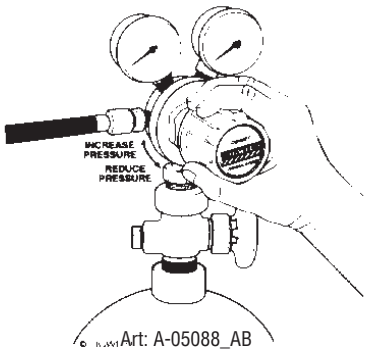


Figure 4-6: Adjust Flow Rate

With the regulator ready for operation, adjust working flow rate as follows:

1. Slowly turn adjusting screw/knob in (clockwise) direction until the outlet gauge indicates the required flow rate.

NOTE

It may be necessary to re-check the shielding gas regulator flow rate following the first weld sequence due to back pressure present within shielding gas hose assembly.

2. To reduce flow rate, allow the welding grade shielding gas to discharge from regulator by opening the downstream valve. Bleed welding grade shielding gas into a well ventilated area and away from any ignition source. Turn adjusting screw counterclockwise, until the required flow rate is indicated on the gauge. Close downstream valve.

Shutdown

Close cylinder valve whenever the regulator is not in use. To shut down for extended periods (more than 30 minutes).

1. Close cylinder or upstream valve tightly.
2. Open downstream equipment valves to drain the lines. Bleed gas into a well ventilated area and away from any ignition source.
3. After gas is drained completely, disengage adjusting screw and close downstream equipment valves.
4. Before transporting cylinders that are not secured on a cart designed for such purposes, remove regulators.

4.03 Setup for TIG (GTAW) Welding

A. Select HF TIG or Lift TIG mode with the process selection control (refer to Section 4.01.10 for further information).

B. Connect the TIG Torch to the negative welding terminal (-). Welding current flows from the power source via heavy duty bayonet type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

C. Connect the work lead to the positive welding terminal (+). Welding current flows from the Power Source via heavy duty bayonet type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

D. Connect the TIG torch trigger switch via the 8 pin socket located on the front of the power source as shown below. The TIG torch will require a trigger switch to operate in HF TIG and Lift TIG Mode.

NOTE

If the TIG torch has a remote TIG torch current control fitted then it will require to be connected to the 8 pin socket. (Refer to section 4.01.07 Remote Control Socket for further information).

E. Fit the welding grade shielding gas regulator/flowmeter to the shielding gas cylinder (refer to Section 4.02) then connect the shielding gas hose from the Power Source to the regulator/flowmeter outlet.

WARNING

Before connecting the work clamp to the work and inserting the tungsten electrode in the TIG Torch make sure the mains power supply is switched off.

Secure the welding grade shielding gas cylinder in an upright position by chaining it to a stationary support to prevent falling or tipping.

CAUTION

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

Loose welding terminal connections can cause overheating and result in the male plug being fused in the terminal.

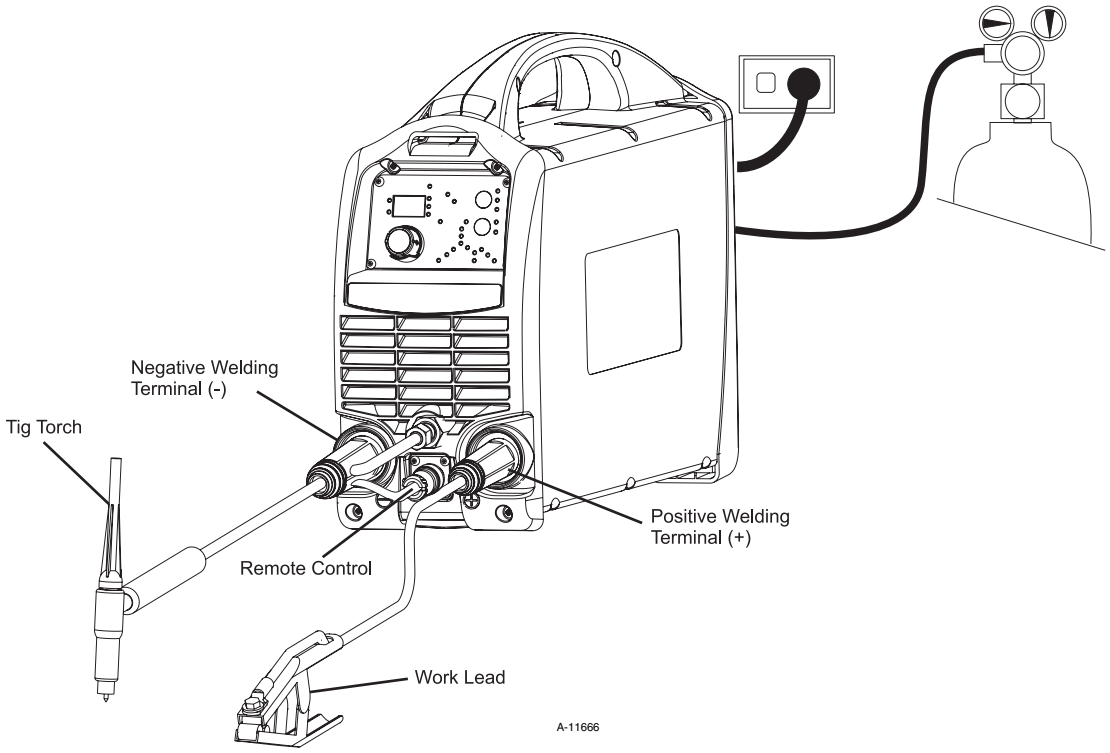


Figure 4-7: Setup for TIG Welding

4.04 Foot Control Part No. W4015800 (Optional Accessory)

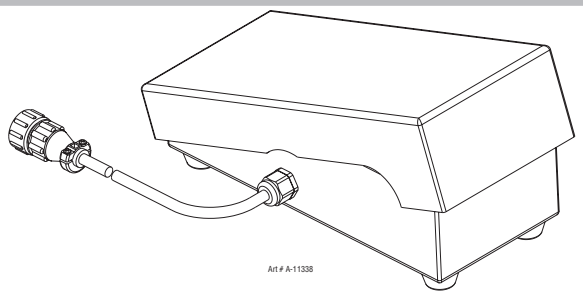


Figure 4-8: Foot Control

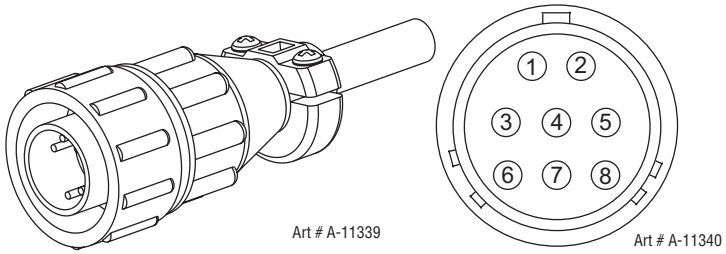


Figure 4-9: 8 Pin Control Plug

Pin	Description
1	Not Used
2	Trigger Switch
3	Trigger Switch
4	Not Used
5	Potentiometer Maximum
6	Potentiometer Minimum
7	Potentiometer Wiper
8	Not Used

Table 4-2

Description

The CIGWELD Foot Control is a foot operated switch and potentiometer which starts and stops the welding process and controls welding current through operation of the foot pedal. Refer to list below for compatible Cigweld power sources.

Installation

Attach the 8-pin connector on the end of the cable to the 8-pin receptacle on the front of the welding machine. To complete the connection, align the keyway, insert the plug, and rotate the threaded collar fully clockwise.

Foot Control Operation

Press the foot pedal to start the machine output functions. The foot control potentiometer controls the welding current up to the level set on the welding power source. Note that the maximum current must be set on the power source by the operator **prior** to the foot control being connected, although this can be adjusted while you are welding.

With the foot control connected, the power source will only display minimum preview Amps until the foot control is depressed then it displays actual welding current when welding. Pressing the pedal to increases the welding current; letting up on the pedal decreases the welding current. Releasing the pedal completely extinguishes the arc and initiates the post-flow shielding gas timer (where fitted).

Note that some power sources may require the remote/local switch set to remote, the maximum setting of the power source will be determined by the respective front panel control, irrespective of the remote control device setting. As an example, if the output current on the power source front panel is set to 50% of the available current and the remote control device is set to 100% output or maximum, the maximum achievable output from the unit will be 50%. Should 100% output be required, the respective front panel control must be set to 100% or maximum, in which case the remote device will then be able to control between 1-100% output.

Note: The foot control will only work correctly when power source trigger mode 2T (Normal) is selected.

4.05 Setup for Manual Arc (MMAW) Welding

A. Connect the Electrode Holder lead to the positive welding terminal (+). If in doubt, consult the electrode manufacturer. Welding current flows from the Power Source via heavy duty bayonet type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

B. Connect the work lead to the negative welding terminal (-). If in doubt, consult the electrode manufacturer. Welding current flows from the power source via heavy duty bayonet type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

WARNING

Before connecting the work clamp to the work and inserting the electrode in the electrode holder make sure the mains power supply is switched off.

CAUTION

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

Loose welding terminal connections can cause overheating and result in the male plug being fused.

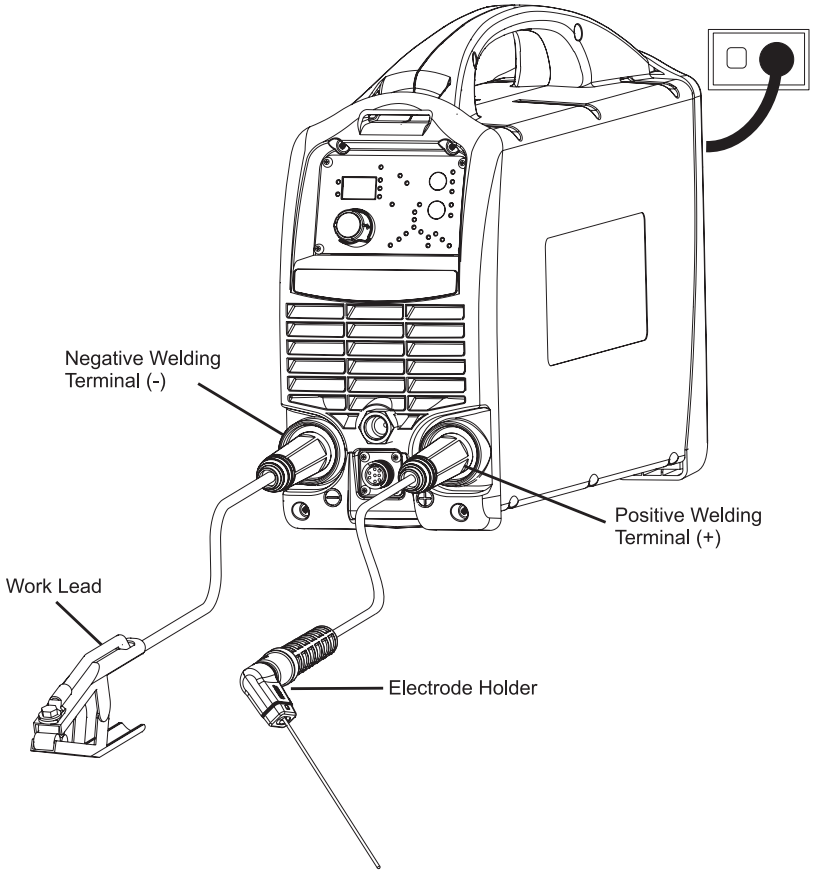


Figure 4-10: Setup for Manual Arc Welding

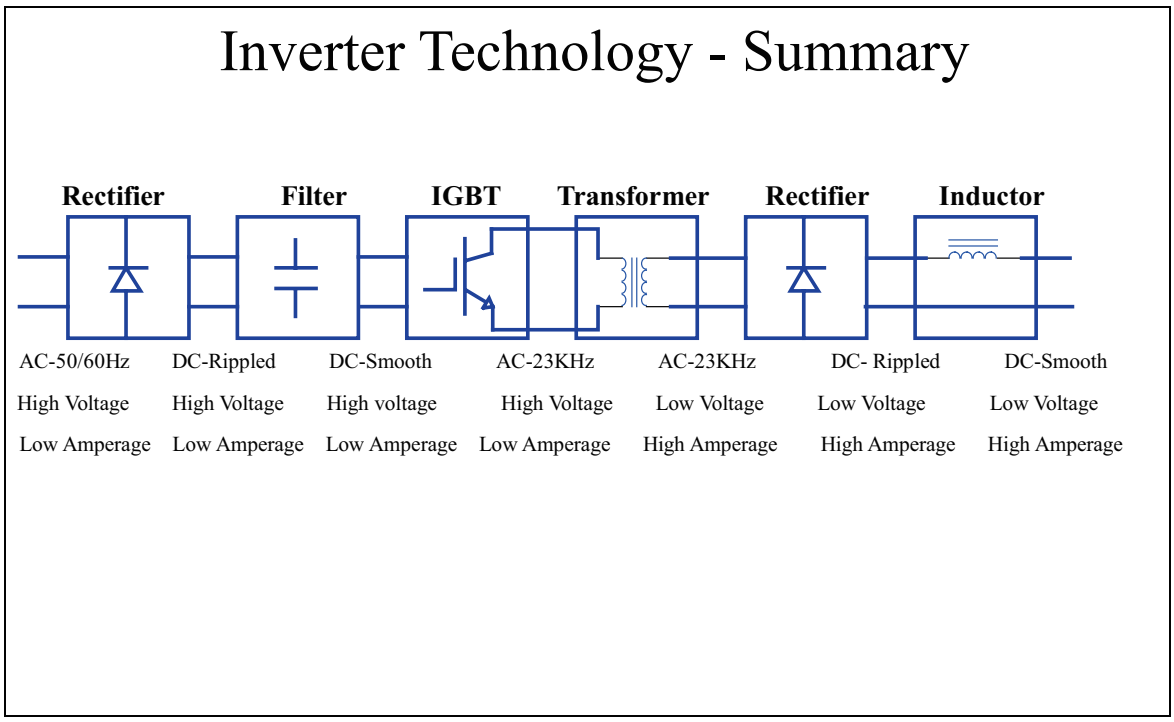
Notes

SECTION 5:
THEORY OF OPERATION

5.01 Inverter Design

What does the word inverter mean?

The term inverter refers to the ability to change DC power into AC. Inverter power supplies immediately rectify the incoming AC to DC, and then the transistors create a higher frequency AC. The higher frequency AC then goes on to a much smaller main transformer than in a conventional power supply. The AC is then rectified to extremely smooth DC. The diagram to the below shows the basic electrical wiring of a DC output inverter power supply.



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Notes

SECTION 6:
TROUBLESHOOTING

6.01 Basic Troubleshooting

FAULT	CAUSE	REMEDY
1 Mains supply voltage is ON, Amps Display is illuminated however unit will not commence welding when the torch trigger switch is depressed.	A Power source is not in the correct mode of operation. B Faulty torch trigger.	A Set the power source to the correct mode of operation with the process selection switch. B Repair or replace torch trigger switch/lead.
2 Fault Indicator is illuminated and unit will not commence welding when the torch trigger switch is depressed.	Duty cycle of power source has been exceeded.	Leave the power source switched ON and allow it to cool. Note that fault indicator must be extinguished prior to commencement of welding.
3 Welding arc cannot be established.	A Poor or no work lead contact. B Trigger switch faulty or disconnected.	A Clean work clamp area and ensure good electrical contact. B Connect or repair trigger switch.
4 No gas flow in TIG mode.	A Gas hose is damaged. B Gas passage contains impurities. C Gas regulator turned off. D Empty gas cylinder.	A Replace or repair. B Disconnect gas hose from the rear of power source or wirefeeder and blow out impurities. C Turn on regulator. D Replace gas cylinder.
5 Gas flow continues after the torch trigger switch has been released (TIG mode).	A Gas valve has jammed open due to impurities in the gas or the gas line. B Post flow is active in TIG modes.	A Have an accredited CIGWELD service provider repair or replace gas valve. B Reduce post flow time
6 Amps Display will not illuminate and welding arc cannot be established.	The mains supply voltage has exceeded voltage limits of the power source.	Ensure that the mains supply voltage is within 240VAC ± 15%.
7 TIG electrode melts when arc is struck.	TIG torch is connected to the (+) VE terminal.	Connect the TIG torch to the (-) VE terminal.
8 Arc flutters during TIG welding.	Tungsten electrode is too large for the welding current.	Select the correct size of tungsten electrode. Refer to Table 4-3 in the Operating Manual.
9 No HF on the welding output	A HF TIG mode is not selected B Faulty HF pcb.	A Set the power source to HF TIG mode of operation with the process selection switch. B Have an accredited CIGWELD service provider repair or replace the HF pcb

10	Fault light is on, and E-1 is shown on the Amps display.	A	Fail to Safe protection has operated in STICK mode- VRD fault.	A Reset mains power, if fault does not clear then have an accredited CIG-WELD service provider repair unit.
		B	Fail to safe protection has operated in TIG mode- Inverter fault.	B Reset mains power, if fault does not clear then have an accredited CIG-WELD service provider repair unit.
		C	External voltage has been applied to the welding circuit	C Reset mains power and remove the source of the external voltage

Table 6-1

6.02 Power Source Faults

The following table is a guide for analysing problems and making repairs to the Power Source.

	FAULT		POSSIBLE CAUSE		REMEDY
1	There is no weld output and all front panel displays are off	A B C D E F	The main Power Switch is set to OFF Line fuse is blown The main Power Switch is faulty Faulty Power Inverter PCB Faulty Control PCB Faulty Display PCB	A B C D E F	Set main Power Switch to ON Replace Line fuse Replace main Power Switch Replace Power Inverter PCB Replace Control PCB Replace Display PCB
2	There is no weld output and all front panel displays are off or flickering on & off	A	The internal protection circuit to shut the unit down if the mains supply voltage is too high has operated	A	Check to see if mains supply voltage is < 274 VAC. A generator with poor voltage regulation may cause a supply voltage in excess of 274 VAC. Connect Power Source to a supply voltage < 274 VAC.
3	There is no weld output and the yellow over temperature light is on	A B C	Unit has overheated Airflow inlet or outlet ducts are blocked Fan does not operate	A B C	Allow unit to cool with fan running until over temperature light extinguishes Remove blockages from airflow ducts Replace fan. Check fan wiring header is plugged securely into Control PCB. Check fan wiring is not damaged
4	Mode switch does not change welding mode	A	Faulty Display PCB	A	Replace Display PCB
5	The weld output do not operate when the torch trigger switch is depressed	A B C D E F G	Internal wiring fault Over temperature light is on Trigger wires shorted to weld voltage inside TIG torch Trigger wires or torch switch faulty Faulty Power Inverter PCB Faulty Control PCB Faulty Display PCB	A B C D E F G	Check continuity of internal wiring from8 pin control socket through to boards Allow unit to cool Repair trigger wires in torch Check & Repair Replace Power Inverter PCB Replace Control PCB Replace Display PCB
6	Weld Output operates when the torch trigger switch is depressed but the gas valve does not operate.	A B C D E	Internal wiring fault Faulty Solenoid Impurity in gas system causing solenoid to stay open or closed Faulty Power Inverter PCB Faulty Control PCB	A B C D E	Check solenoid wiring header is plugged securely into Control PCB. Check solenoid wiring is not damaged Replace Solenoid Clean out gas system. Disassemble solenoid & clean out impurities Replace Power Inverter PCB Replace Control PCB
7	Weld Output operates when the torch trigger switch is depressed but the HF does not operate.	A B C D	Internal wiring fault Faulty HF PCB Faulty Power Inverter PCB Faulty Control PCB	A B C D	Check HF PCB wiring headers are plugged securely into Control and Inverter PCB. Check wiring is not damaged Replace HF PCB Replace Power Inverter PCB Replace Control PCB

Table 6-2

6.03 Factory Reset

To perform a Factory Reset, press the Trigger Mode Button while turning on the mains power.

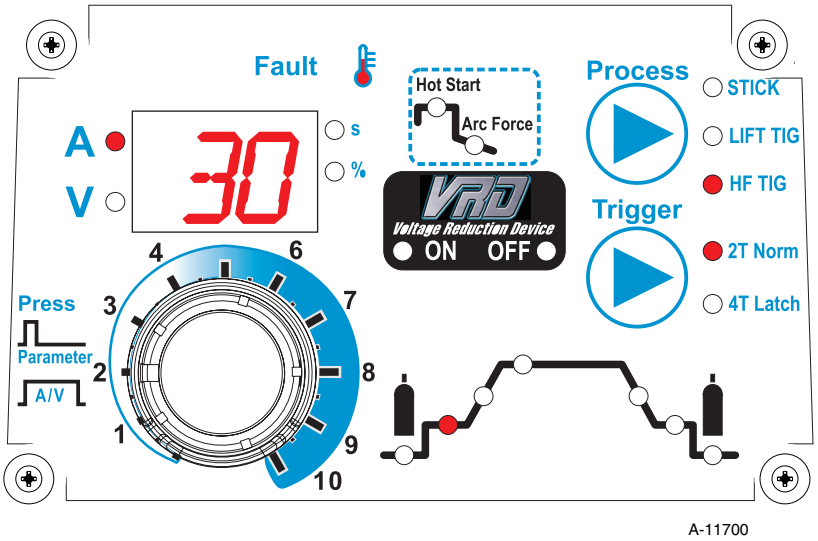


Figure 6-1

NOTE

In some cases a fault may be caused by mis-adjustment of parameters. Performing a factory reset may correct this.

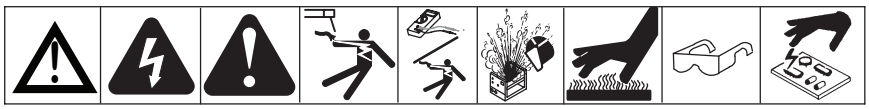
6.04 Advanced Troubleshooting

If the problem cannot be solved by the basic (external) troubleshooting guide, the Power Source covers will have to be removed to allow the technician to analyse failures with a few common tools.

WARNING

Turn off power and disconnect mains supply plug from receptacle before working on the unit. Allow two minutes for capacitors to discharge after disconnection from mains supply voltage.

Checking Unit Before Applying Power



The following safety information shall be read before starting troubleshooting and servicing.

1. Turn ON/OFF Switch to OFF position, and disconnect unit from primary line voltage before working on unit.
2. Significant DC voltage can remain on capacitors after unit is OFF. Wait until all front panel LED's are OFF before removing case.
3. Check DC bus voltage according to Section 6.10 after removing case and make sure the DC bus voltage is closed 0V.
4. Before troubleshooting or applying power to unit, complete the following checks to avoid causing further damage.

6.05 Test Equipment and Tools for Troubleshooting and Servicing

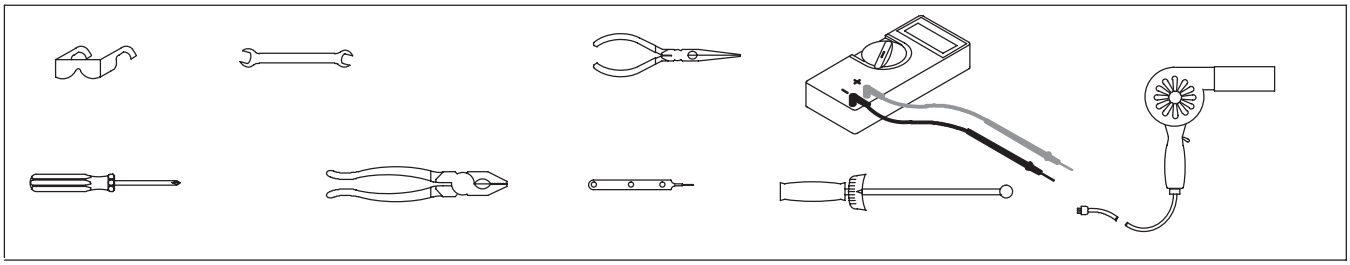


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Figure 6-2: Test Equipment and Tools

- Digital Multimeter
- DC clip-on ammeter
- Screwdriver and spanner
- CRO (20 Mhz bandwidth) & isolating transformer

6.06 Visually Inspect

Visually inspect the inside of the Power Source. The levels of current present in these units can cause burning or arcing of PCB, transformers, switches, or rectifier when a failure occurs. Carefully inspect all components within these units.

Look in particular for the following:

a) Loose or broken wires or connectors.

b) Burned or scorched parts or wires or evidence of arcing.

c) Any accumulation of metal dust or filings that may have caused shorting or arcing.

If any parts are damaged, they must be replaced. Refer to the Spare Parts section for a complete list of components used in the Power Source.

Locate the faulty component(s) then replace where necessary.

6.07 Preliminary DC Bus Measurement of the Main Inverter PCB

WARNING

Check DC bus voltage has discharged to less than 5VDC before servicing. Ensure the mains supply plug is disconnected from receptacle.

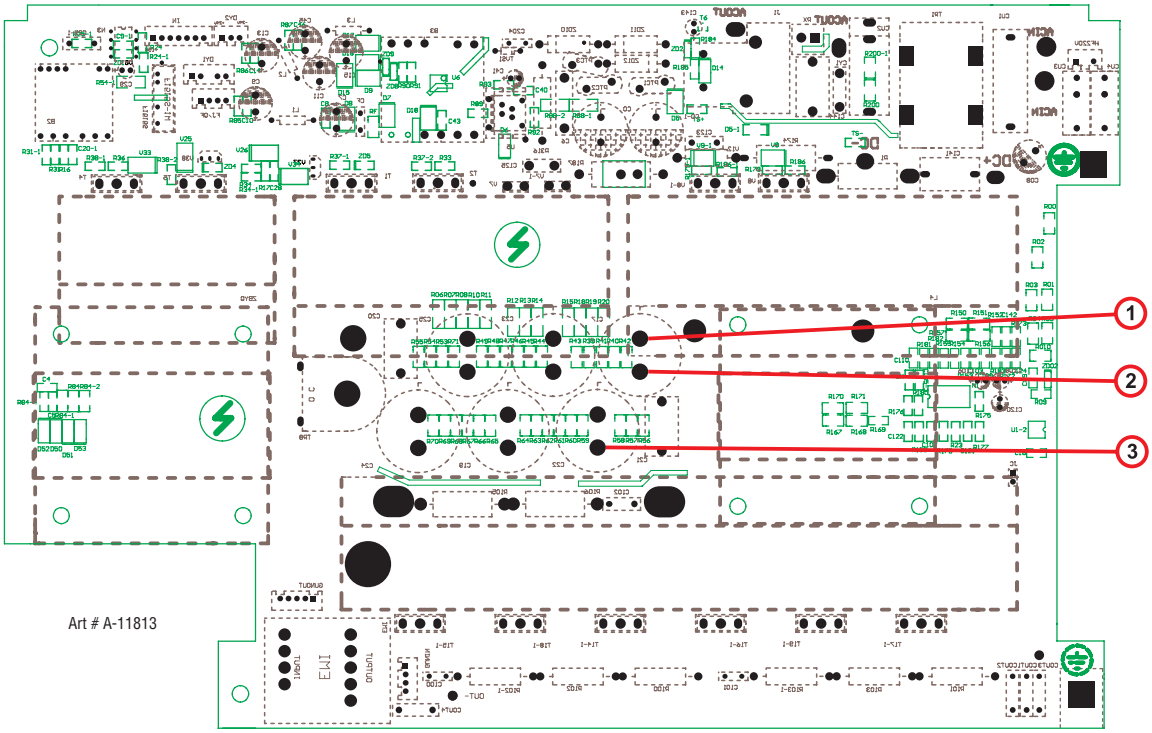


Figure 6-3: Preliminary DC Bus Measurement of the Main Inverter PCB

DC Bus Testing	Multimeter Lead Placement	Voltage with Supply Voltage OFF
Upper capacitor bank	Positive meter lead to TP 1 Negative meter lead to TP 2	0 VDC
Lower capacitor bank	Positive meter lead to TP 2 Negative meter lead to TP 3	0 VDC

Table 6-3: DC BUS, Multimeter set to measure DC volts

6.08 Preliminary Check of the Main Inverter PCB

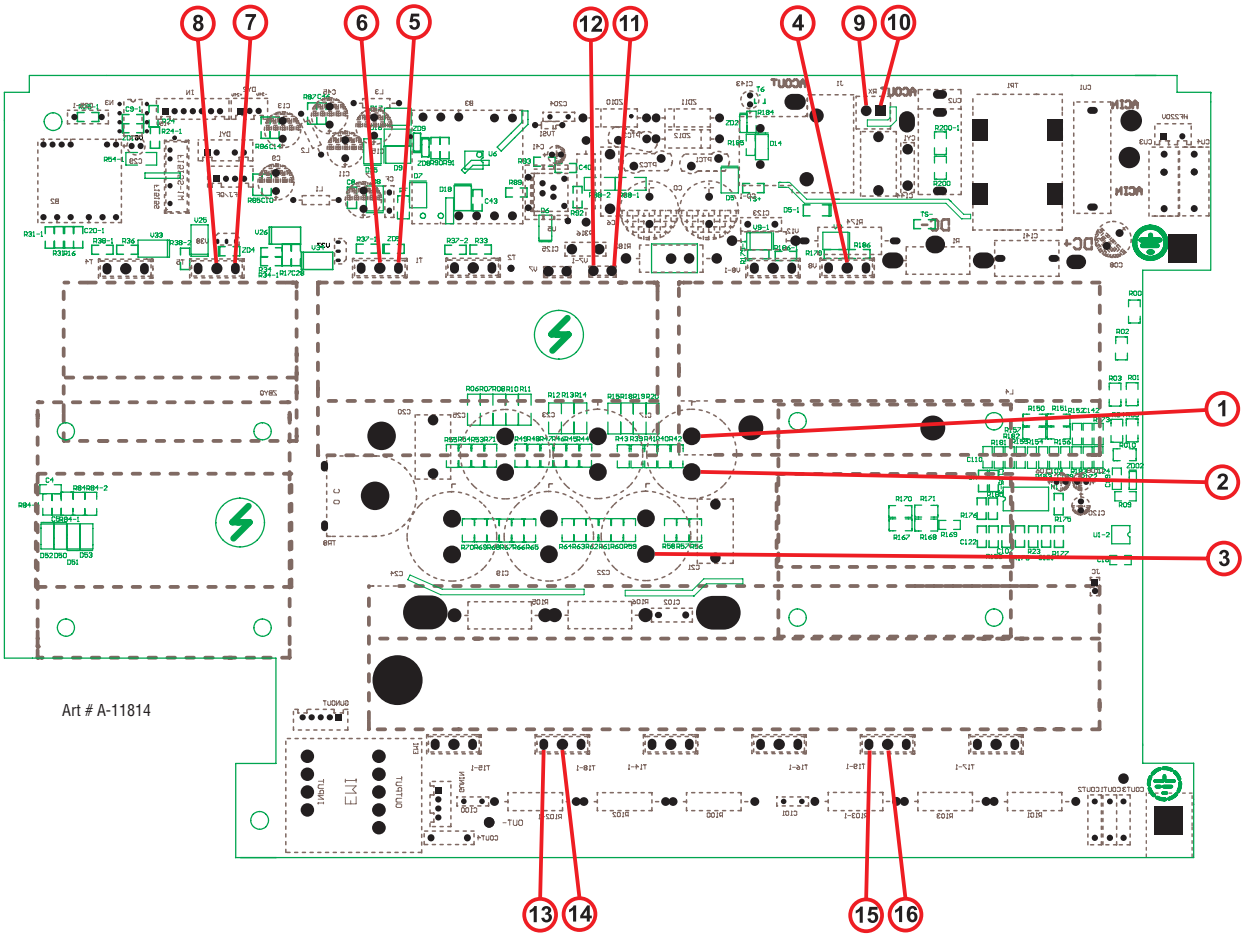


Figure 6-4: Preliminary Check of the Main Inverter PCB

IGBT Testing	Multimeter Lead Placement	Diode Voltage
IGBT V8 & V8-1	Positive meter lead to TP 3 Negative meter lead to TP 4	0.2 – 0.8 VDC
IGBT T1 & T2	Positive meter lead to TP 5 Negative meter lead to TP 6	0.2 – 0.8 VDC
IGBT T4 & T5	Positive meter lead to TP 7 Negative meter lead to TP 8	0.2 – 0.8 VDC

Table 6-4: IGBT's, Multimeter set to measure Diode Voltage

IGBT Testing	Multimeter Lead Placement	Ohms
IGBT V8 & V8-1	Positive meter lead to TP 4 Negative meter lead to TP 3	>150 Ω
IGBT T1 & T2	Positive meter lead to TP 6 Negative meter lead to TP 5	>150 Ω
IGBT T4 & T5	Positive meter lead to TP 8 Negative meter lead to TP 7	>150 Ω

Table 6-5: IGBT's, Multimeter set to measure ohms (Ω)

Inrush Resistor	Multimeter Lead Placement	Ohms
Resistor	Positive meter lead to TP 9 Negative meter lead to TP 10	4 Ω

Table 6-6: Inrush PTC, Multimeter set to measure ohms (Ω)

DIODE Testing	Multimeter Lead Placement	Diode Voltage
DIODE V7 & V7-1	Positive meter lead to TP 11 Negative meter lead to TP 12	0.2 – 0.8 VDC
DIODE T14, T15, T18	Positive meter lead to TP 13 Negative meter lead to TP 14	0.2 – 0.8 VDC
DIODE T16, T17, T19	Positive meter lead to TP 15 Negative meter lead to TP 16	0.2 – 0.8 VDC

Table 6-7: Diodes, Multimeter set to measure Diode Voltage

6.09 Check Main Input Rectifier

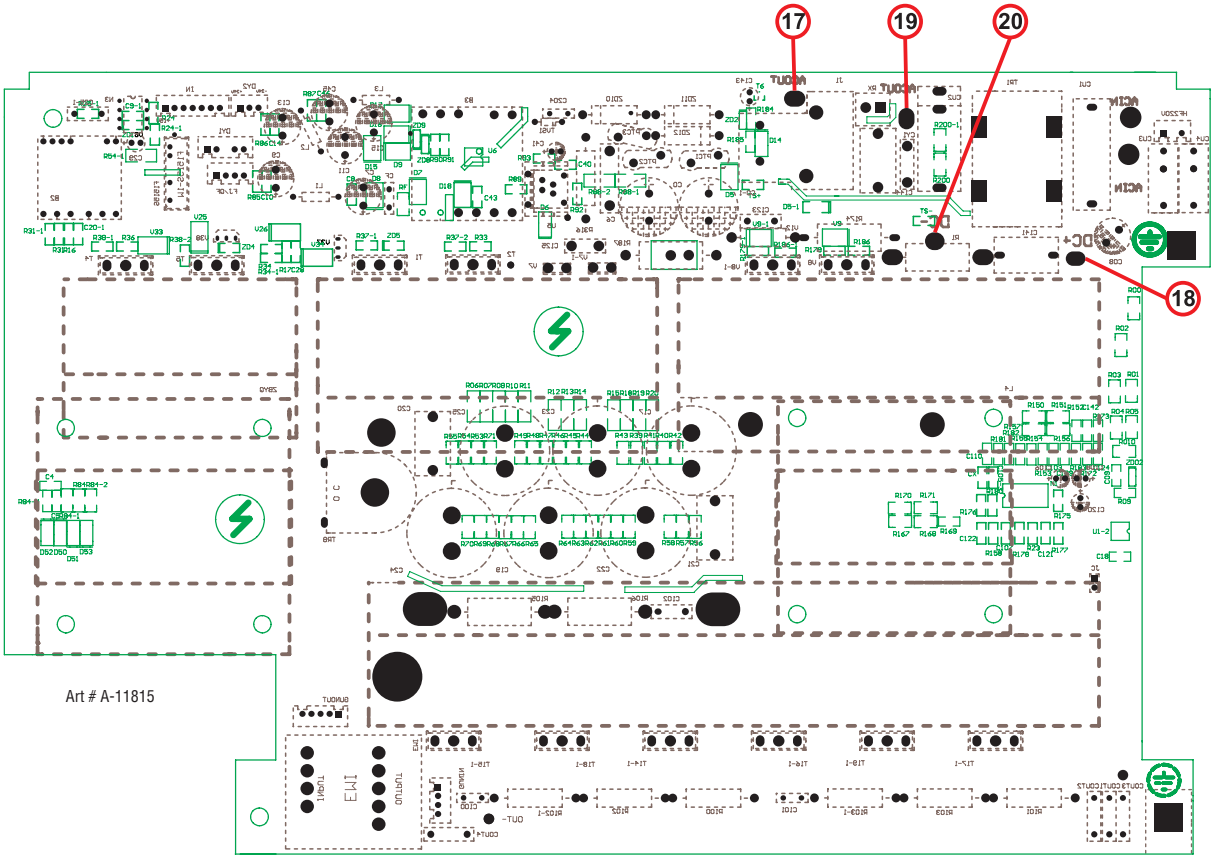


Figure 6-5: Check Main Input Rectifier

Input Rectifier Testing	Multimeter Lead Placement	Diode Voltage
AC1 to DC+	Positive meter lead to 17 Negative meter lead to TP 18	0.2 – 0.8 VDC
AC2 to DC+	Positive meter lead to 19 Negative meter lead to TP 18	0.2 – 0.8 VDC
AC1 to DC-	Positive meter lead to TP 17 Negative meter lead to TP 20	0.2 – 0.8 VDC
AC2 to DC-	Positive meter lead to TP 19 Negative meter lead to TP 20	0.2 – 0.8 VDC

Table 6-8: Input Rectifier, Multimeter set to measure Diode Voltage

6.10 DC Bus Voltage Measurement

Apply voltage to the Power Source.

WARNING

There are extremely dangerous voltage and power levels present inside these Power Sources. Do not attempt to diagnose or repair unless you have had training in power electronics measurement and troubleshooting techniques.

Once power is applied to the Power Source, there are extremely hazardous voltage and power levels present.

Do not touch any live parts.

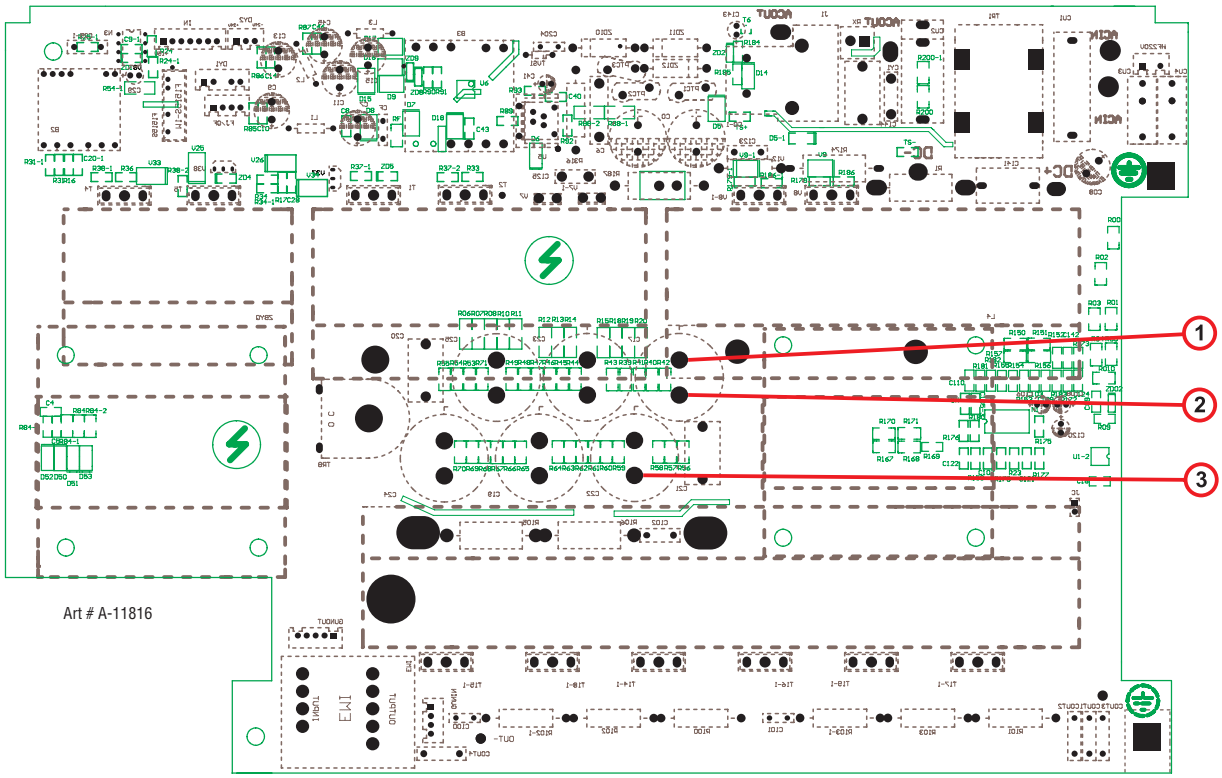


Figure 6-6: DC Bus Voltage Measurement

DC Bus Testing	Multimeter Lead Placement	Voltage with Supply Voltage ON
Upper capacitor bank	Positive meter lead to TP 1 Negative meter lead to TP 2	150-200 VDC
Lower capacitor bank	Positive meter lead to TP 2 Negative meter lead to TP 3	150-200 VDC
Overall capacitor bank	Positive meter lead to TP 1 Negative meter lead to TP 3	300-400 VDC

Table 6-9: DC BUS, Multimeter set to measure DC volts

NOTE

These DC voltages are at nominal mains supply voltage of 240VAC.

6.11 PCB Connectors

1. Inverter PCB

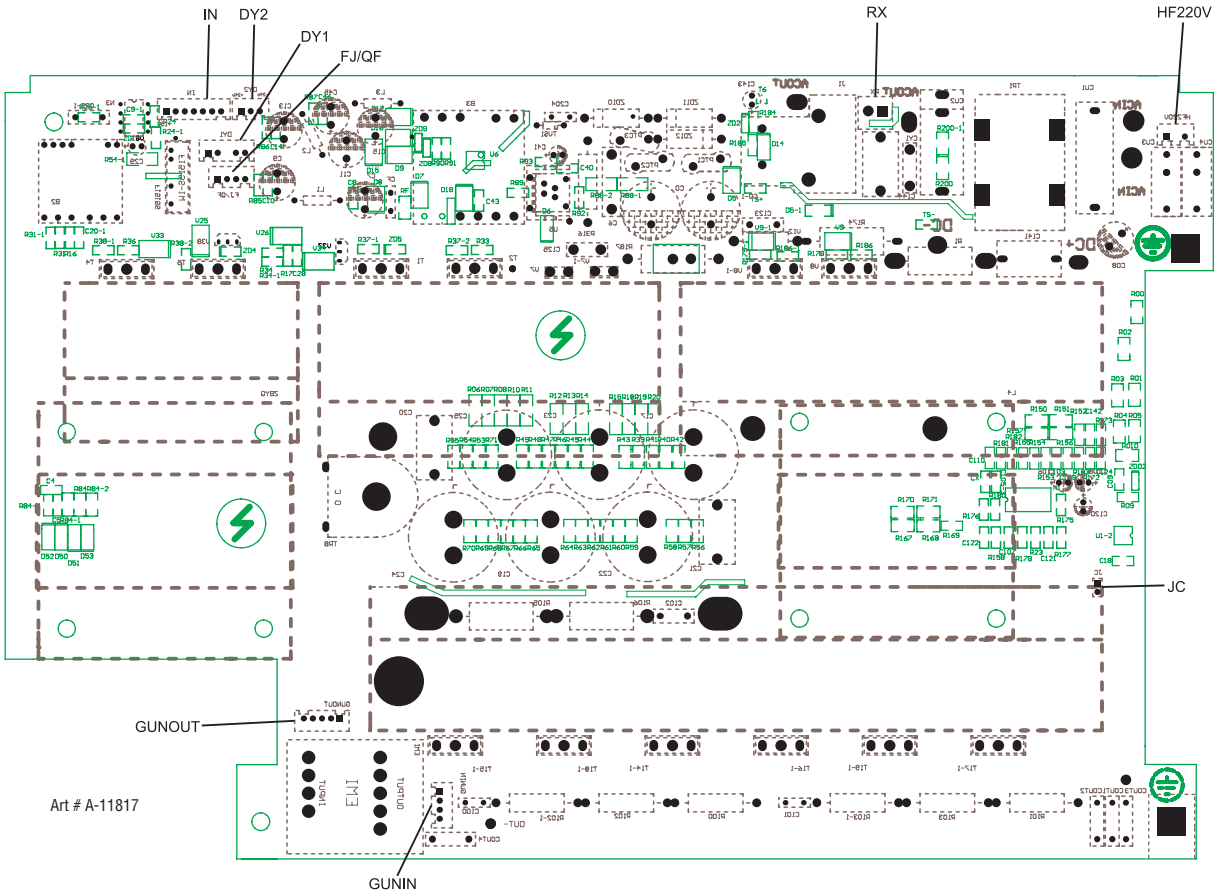


Figure 6-7: Inverter PCB Connectors

IN Header Pin	Pin function	Signal
1	+15V	15 VDC
2	IGBT 1 pwm drive signal, 15V p-p square wave	15 VDC pk
3	IGBT 2 pwm drive signal, 15V p-p square wave	15 VDC pk
4	IGBT 2 pwm drive signal, 15V p-p square wave	15 VDC pk
5	IGBT 1 pwm drive signal, 15V p-p square wave	15 VDC pk
6	Rectified secondary of current transformer TR8	15 VDC pk
7	0V	0 VDC

Table 6-10: IN Header pin function (connects to DRIVE header on control PCB)

DY2 Header Pin	Pin function	Signal
1	+24V	24 VDC
2	0V	0 VDC
3	-24V	-24 VDC

Table 6-11: DY2 Header pin function (connects to SOURCE header on control PCB)

DY1 Header Pin	Pin function	Signal
1	+24V (solenoid positive)	24 VDC
2	0V	0 VDC
3	No connection	n/c
4	No connection	n/c
5	No connection	n/c

Table 6-12: DY1 Header pin function

FJ/QF Header Pin	Pin function	Signal
1	No connection	n/c
2	+24V	24 VDC
3	+24V	24 VDC
4	0V	0 VDC

Table 6-13: FJ/QF Header pin function (not used)

RX Header Pin	Pin function	Signal
1	Inrush Resistor	
2	Inrush Resistor	

Table 6-14: RX Header pin function (connects to Inrush Resistor)

JC Header Pin	Pin function	Signal
1	+5V	+5 VDC
2	PFC OK signal, 5V = PFC OK	

Table 6-15: JC Header pin function (connects to PFC header on control PCB)

HF220V Header Pin	Pin function	Signal
1	240VAC active	240VAC
2	240VAC neutral	0 VAC

Table 6-16: HF220V Header pin function (connects to 220V header on HF PCB)

GUNIN Header Pin	Pin function	Signal
1	Trigger 8 pin socket, pin 2	
2	Remote Amps Pot, 8 pin socket, pin 5	
3	Remote Amps Pot, 8 pin socket, pin 6	
4	Trigger 8 pin socket, pin 3	0 VDC

Table 6-17: GUNIN Header pin function (connects to 8 pin remote socket)

GUNOUT Header Pin	Pin function	Signal
1	Trigger 8 pin socket, pin 3	0 VDC
2	Trigger 8 pin socket, pin 2	
3	Remote Amps Pot, 8 pin socket, pin 5	
4	Remote Amps Pot, 8 pin socket, pin 6	
5	Trigger 8 pin socket, pin 3	0 VDC

Table 6-18: GUNOUT Header pin function (connects to GUN header on control PCB)

2. Display PCB

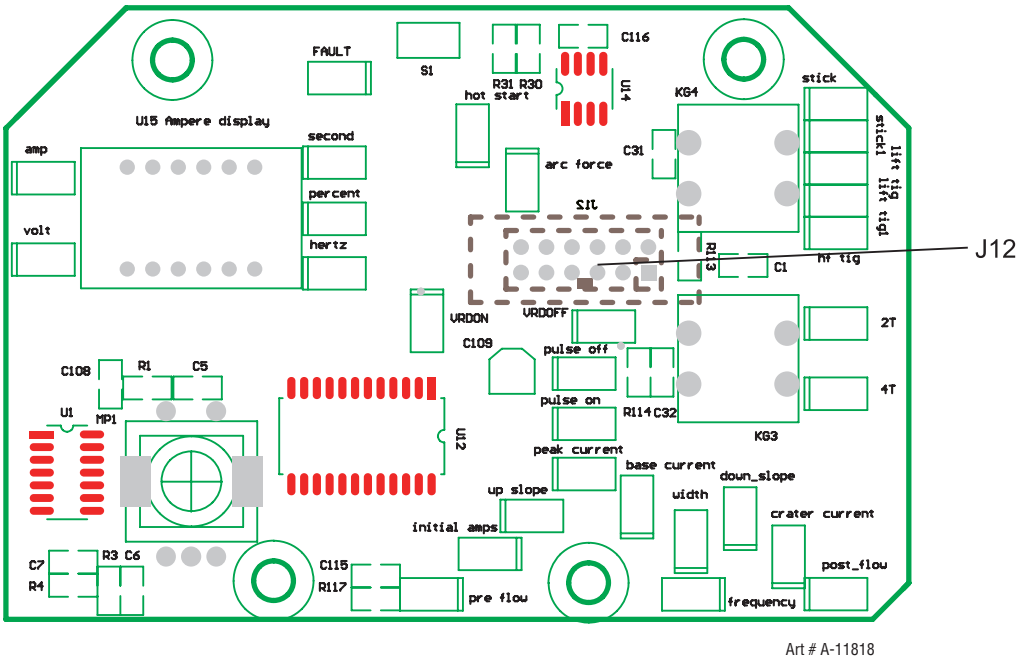


Figure 6-8: Display PCB Connectors

J12 Header Pin	Pin function	Signal
1	Serial display data (LOAD)	5 VDC digital
2	Serial display data & eprom (D-IN)	5 VDC digital
3	Serial display data (CLK)	5 VDC digital
4	Serial display eprom (D-OUT)	5 VDC digital
5	DeadMan Switch (5V in DeadMan mode)	5 VDC digital
6	Encoder Output “A” (pulse output)	5 VDC digital
7	Encoder Output “D” (button)	5 VDC digital
8	Encoder direction	5 VDC digital
9	2T/4T pushbutton (0V when button pushed)	5 VDC
10	MODE pushbutton (0V when button pushed)	5 VDC
11	0V	0 VDC
12	5 VDC	5 VDC

Table 6-19: J12 Header pin function (connects to MB header on control PCB)

3. Control PCB

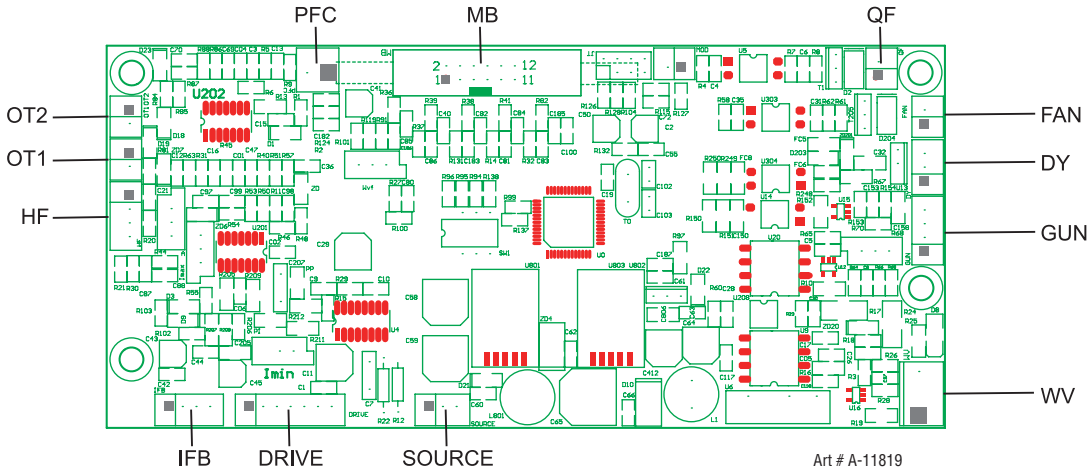


Figure 6-9: Control PCB Connectors

WV Header Pin	Pin function	Signal
1	Positive welding terminal	positive VDC
2	No connection	n/c
3	Negative welding terminal	0 VDC

Table 6-20: WVIN Header pin function

GUN Header Pin	Pin function	Signal
1	Trigger 8 pin socket, pin 3	0 VDC
2	Trigger 8 pin socket, pin 2	
3	Remote Amps Pot, 8 pin socket, pin 5	
4	Remote Amps Pot, 8 pin socket, pin 6	
5	Trigger 8 pin socket, pin 3	0 VDC

Table 6-21: GUN Header pin function (connects to GUNOUT header on Inverter PCB)

DY Header Pin	Pin function	Signal
1	0V	0 VDC
2	+24VDC	24 VDC

Table 6-22: DY Header pin function (connects to DY1 header on Inverter PCB)

FAN Header Pin	Pin function	Signal
1	Fan control signal, 0V = Fan ON	
2	24VDC	+24 VDC

Table 6-23: FAN Header pin function (connects to Fan)

QF Header Pin	Pin function	Signal
1	Solenoid control signal, 0V = Solenoid ON	
2	24VDC	+24 VDC

Table 6-24: QF Header pin function (connects to Solenoid)

MB Header Pin	Pin function	Signal
1	Serial display data (LOAD)	5 VDC digital
2	Serial display data & eprom (D-IN)	5 VDC digital
3	Serial display data (CLK)	5 VDC digital
4	Serial display eprom (D-OUT)	5 VDC digital
5	DeadMan Switch (5V in DeadMan mode)	5 VDC digital
6	Encoder Output “A” (pulse output)	5 VDC digital
7	Encoder Output “D” (button)	5 VDC digital
8	Encoder direction	5 VDC digital
9	2T/4T pushbutton (0V when button pushed)	5 VDC
10	MODE pushbutton (0V when button pushed)	5 VDC
11	0V	0 VDC
12	5 VDC	5 VDC

Table 6-25: MB Header pin function (connects to J12 header on display PCB)

PFC Header Pin	Pin function	Signal
1	0V	0 VDC
2	PFC OK signal, 0= PFC OK	

Table 6-26: PFC Header pin function (connects to JC header on inverter PCB)

OT1 Header Pin	Pin function	Signal
1	Thermostat	
2	Thermostat	

Table 6-27: OT1 Header pin function (connects to thermostat)

OT2 Header Pin	Pin function	Signal
1	Link to 0V	
2	0V	0 VDC

Table 6-28: OT2 Header pin function (link)

HF Header Pin	Pin function	Signal
1	0V	0 VDC
2	HF control line (0V = HF OFF)	
3	HF control line 120/240VAC (0V = 240VAC supply)	0 VDC
4	+24V	24 VDC

Table 6-29: HF Header pin function (Connects to SOUHF header on HF PCB)

IFB Header Pin	Pin function	Signal
1	+15V	15 VDC
2	-15V	-15 VDC
3	Current sensor signal	
4	0V	0 VDC

Table 6-30: IFB Header pin function (Connects to welding output current sensor)

DRIVE Header Pin	Pin function	Signal
1	+15V	15 VDC
2	IGBT 1 pwm drive signal, 15V p-p square wave	15 VDC pk
3	IGBT 2 pwm drive signal, 15V p-p square wave	15 VDC pk
4	IGBT 2 pwm drive signal, 15V p-p square wave	15 VDC pk
5	IGBT 1 pwm drive signal, 15V p-p square wave	15 VDC pk
6	Rectified secondary of current transformer TR8	15 VDC pk
7	0V	0 VDC

Table 6-31: DRIVE Header pin function (connects to IN header on inverter PCB)

SOURCE Header Pin	Pin function	Signal
1	+24V	24 VDC
2	0V	0 VDC
3	-24V	-24 VDC

Table 6-32: SOURCE Header pin function (connects to DY2 header on Inverter PCB)

4. HF PCB

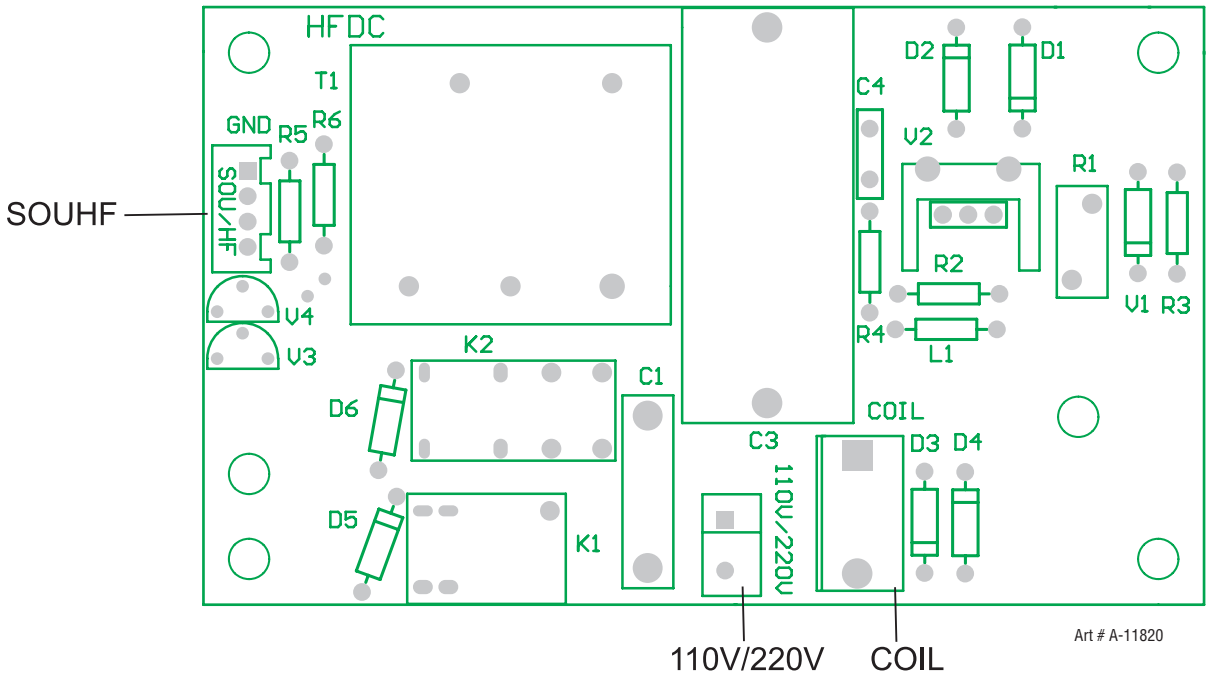


Figure 6-10: HF PCB Connectors

SOUHF Header Pin	Pin function	Signal
1	0V	0 VDC
2	HF control line (0V = HF OFF)	
3	HF control line 120/240VAC (0V = 240VAC supply)	0 VDC
4	+24V	24 VDC

Table 6-33: SOUHF Header pin function (Connects to HF header on Control PCB)

110V/220V Header Pin	Pin function	Signal
1	240VAC Active	240 VAC
2	No connection	n/c
3	240VAC Neutral	0 VAC

Table 6-34: 110V/220V Header pin function (Connects to HF220 header on Inverter PCB)

COIL Header Pin	Pin function	Signal
1	HF primary coil	
2	HF primary coil	

Table 6-35: COIL Header pin function (Connects to HF primary coil)

6.12 DIP Switch Settings, Control PCB

1. DIP Switch SW1, control PCB

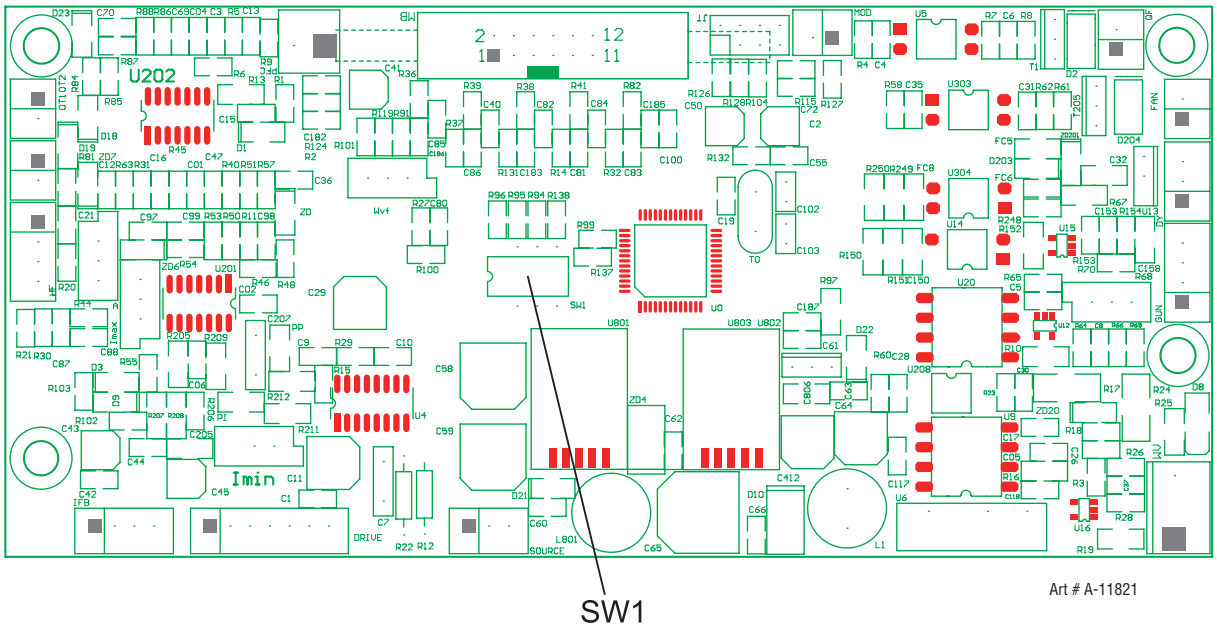


Figure 6-11: DIP Switch SW1, control PCB

SW1 position	Function
1	Set to ON for Transtig 170Ti
2	Set to OFF for Transtig 170Ti
3	Set to OFF for Transtig 170Ti
4	Set to ON for Transtig 170Ti

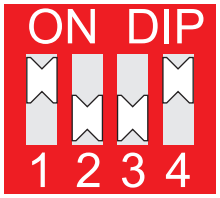


Table 6-36: SW1 DIP Switch functions

6.13 Calibration

1. Calibration

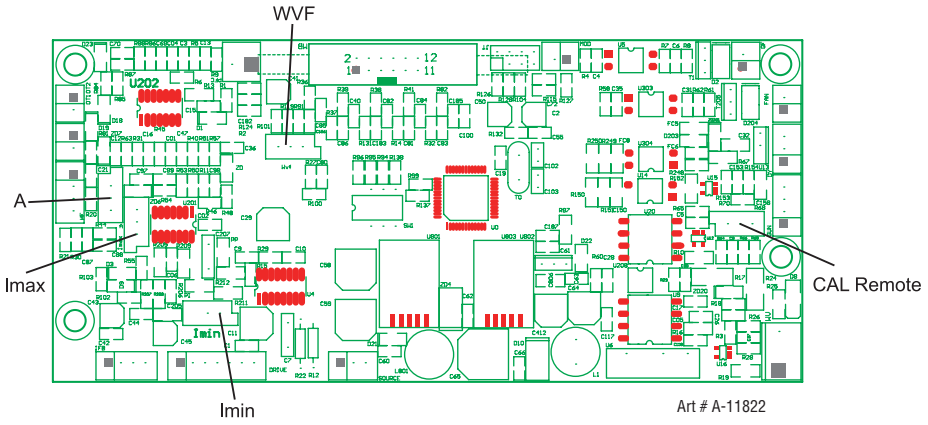
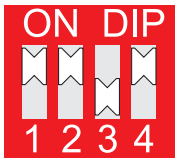


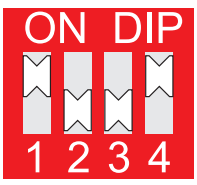
Figure 6-12: Calibration



While the power source is turned off, set SW1 position 2 to ON, to allow calibration of output volts & amps.

2. Output Current Calibration

1. Select STICK mode on the front panel.
2. Connect a load to the output terminals. The load should be of a resistance to give between 20V – 25V at 170A.
3. Set front panel AMPS control to minimum.
4. Adjust Imin trimpot until output amps is 5A +/- 0.5A
5. Set front panel AMPS control to maximum.
6. Adjust Imax trimpot until output amps is 170A +/- 1A
7. Recheck settings.
8. Set front panel AMPS control to maximum.
9. Adjust A potentiometer so Amps display reads within 0.5A of the measured value.
10. Press the front panel AMPS control for > 2 seconds, so that the meter displays weld volts.
11. Disconnect the load from the output terminals.
12. Measure output welding voltage and adjust WVF potentiometer so Volts display reads within 0.1V of the measured value.
13. Press the front panel AMPS control for > 2 seconds, so that the meter displays weld amps.
14. Turn off the mains power off to the machine.
15. Set SW1-2 back to the OFF position.



3. Remote Calibration

1. Select LIFT TIG mode on the front panel.
2. Remove the load from the output terminals.
3. Set front panel AMPS control to maximum.
4. Connect a remote control device and set the remote control potentiometer to maximum.
5. Adjust the CAL REMOTE trimpot until the display starts to fall below 170A
6. Slowly adjust the CAL REMOTE trimpot until the display is “just” reading 170A +/- 0A.

6.14 Main Circuit Description

WARNING

Turn off power and disconnect mains supply plug from receptacle before working on the unit. Allow two minutes for capacitors to discharge after disconnection from mains supply voltage.

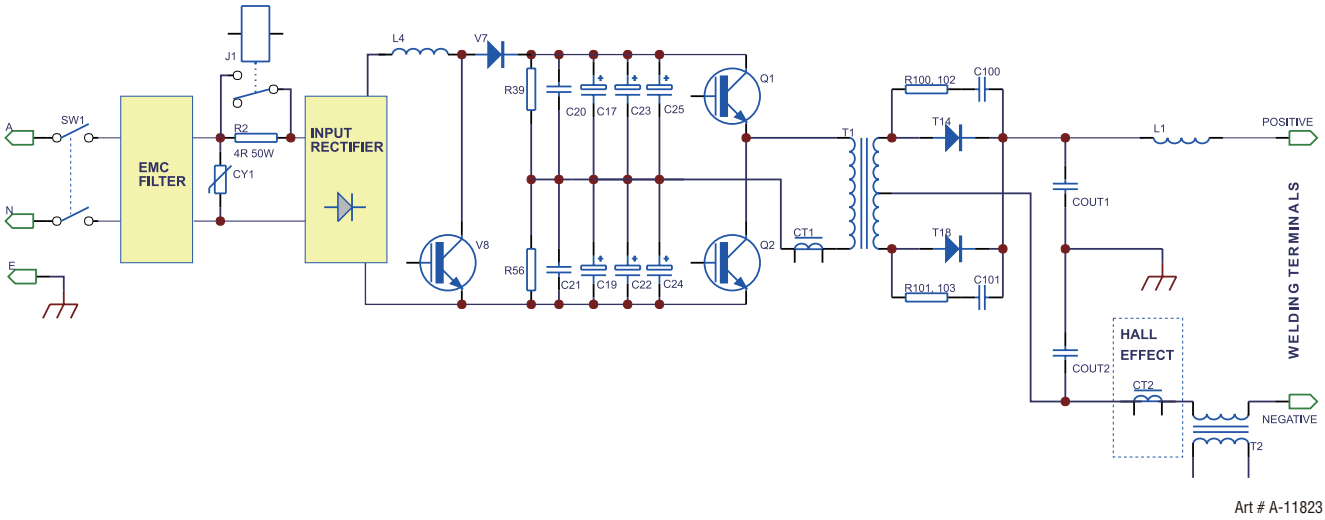


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Figure 6-13: Main Circuit

The mains supply voltage is connected via a double pole switch to the input rectifiers on the main Inverter PCB through an inbuilt EMC filter on the inverter power board. Overvoltage protection is provided by varistor CY1.

The rectifier output charges the main capacitor bank (C17, C19, C22, C23, C24 and C25) to high voltage through PFC IGBT's V8 and PFC diodes V7. Inrush current limiting is provided by an off board resistor R2 which is then bypassed by relay J1 after a few seconds.

The primary igbt transistors (Q1, and Q2) switch the transformer primary at high frequency and varying duty cycle. The transformer return wire is taken from the terminal centre of the main DC bus capacitor bank (the voltage at this point is approximately half the DC bus voltage).

Secondary output voltage from the transformer is rectified by the output diodes (T14, to T18) to DC. This DC is controlled by the PWM of the primary side igbt transistors, and is filtered by an inductor before connecting to the welding output terminals.

A thermal overload device (thermal switch) is fixed to the rectifier heatsinks. When an over temperature occurs, the control circuit inhibits the trigger, gas solenoid, and the welding output. The thermal overload indicator LED on the front panel is illuminated.

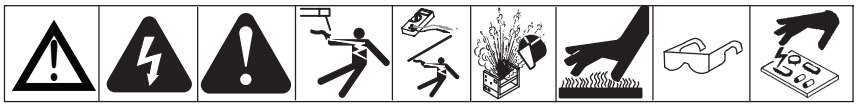
The current transformer CT1 provides a signal to the control circuit to indicate both transformer primary current, and also detect transformer saturation. The Hall effect current sensor CT2 is powered from regulated + & - 15VDC supplies and provides a voltage signal proportional to the output welding current to allow the control circuit to regulate welding current.

High frequency is injected in HF TIG mode to the welding output through transformer T2.

Notes

SECTION 7:
DISASSEMBLY PROCEDURE

7.01 Safety Precautions for Disassembly



NOTE

Read and follow safety information in Section 6.04 before proceeding.

Unplug unit before beginning Disassembly procedure.

7.02 Cover Panel Removal

WARNING

Read and follow safety information in Section 6.04 before proceeding.

1. Remove the eight screws on Cover Panel.
2. Remove the two screws on Front Panel.
3. Remove the two screws on Rear Panel.

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Figure 7-1: Cover Panel Removal

7.03 Front Panel Removal

WARNING

Read and follow safety information in Section 6.04 before proceeding.

1. Remove the two screws at the bottom of Front Panel.
2. Power supply output Negative
3. Power supply output Positive
4. Output terminal bolts. Unscrew power supply output terminal bolts.
5. Disconnect the MB harness from Display PCB.
6. Disconnect the Gun harness from Inverter PCB.
7. Disconnect the gas hose.

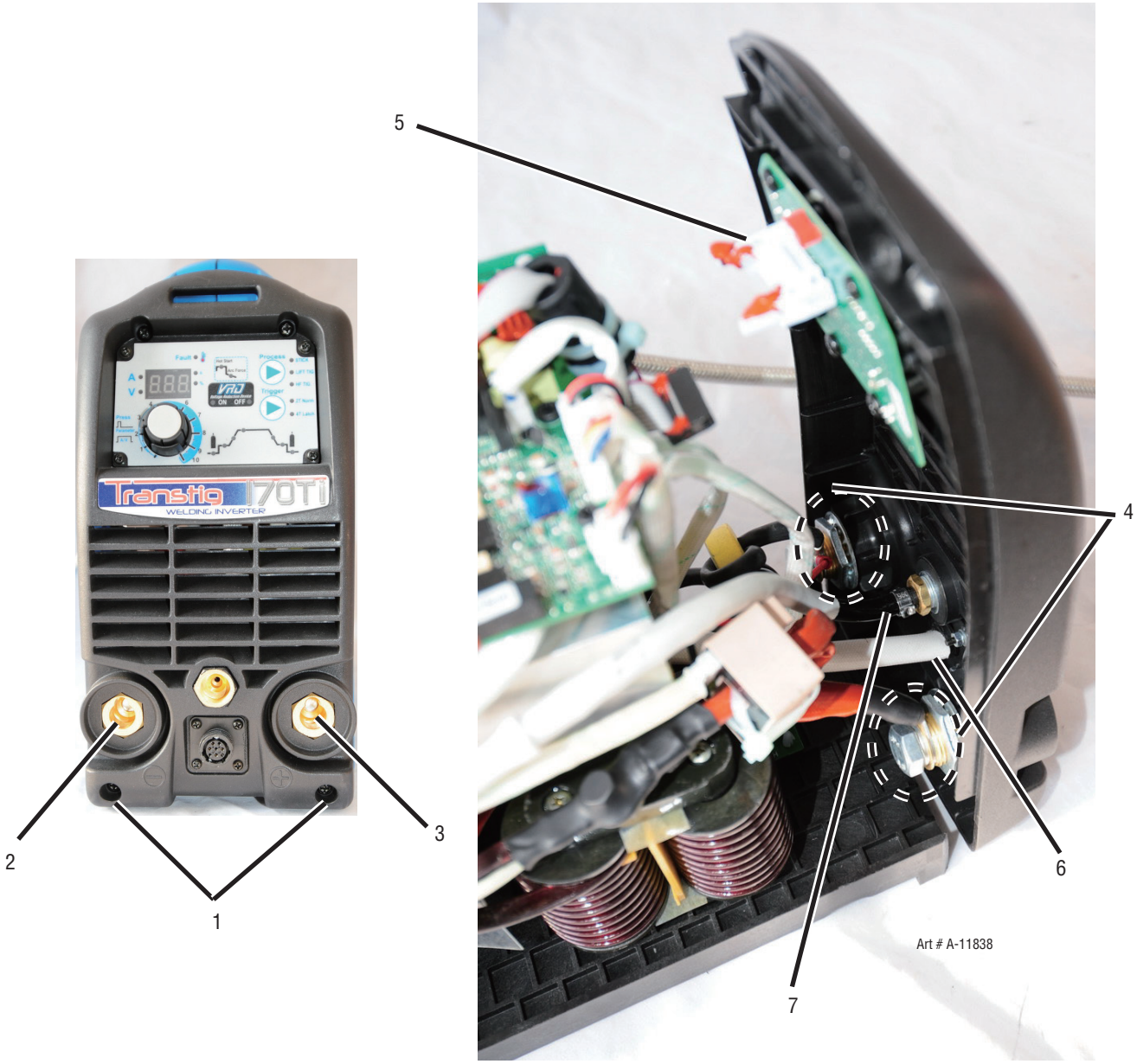


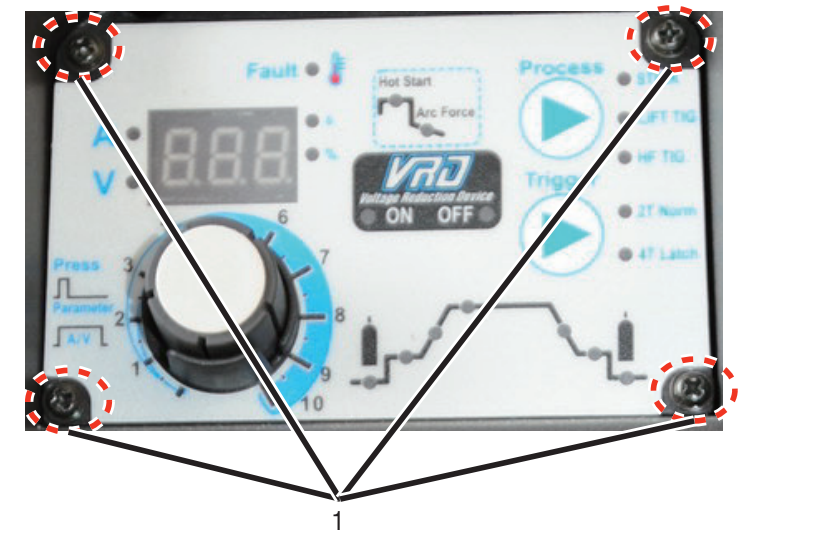
Figure 7-2: Front Panel Removal

7.04 Display PCB Removal

WARNING

Read and follow safety information in Section 6.04 before proceeding.

1. Remove the four screws on Front Panel.
2. Remove the screw on the control knob.
3. Remove the four screws on Display PCB.



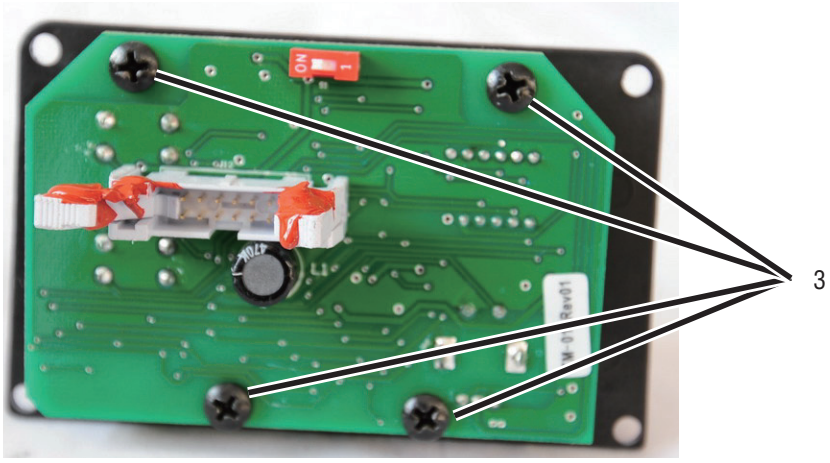


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Figure 7-3: Display PCB Removal

7.05 Control PCB Removal

WARNING

Read and follow safety information in Section 6.04 before proceeding.

1. Remove the four screws securing Control PCB.
2. Disconnect OT1 harness from OT1 connector.
3. Disconnect OT2 harness from OT2 connector.
4. Disconnect PFC harness from PFC connector.
5. Disconnect MB harness from MB connector.
6. Disconnect QF harness from QF connector.
7. Disconnect FAN harness from FAN connector.
8. Disconnect DY harness from DY connector.
9. Disconnect GUN harness from GUN connector.
10. Disconnect WV harness from WV connector.
11. Disconnect SOURCE harness from SOURCE connector.
12. Disconnect DRIVE harness from DRIVE connector.
13. Disconnect IFB harness from IFB connector.
14. Disconnect HF harness from HF connector.

Ensure to unplug all harness from control PCB.

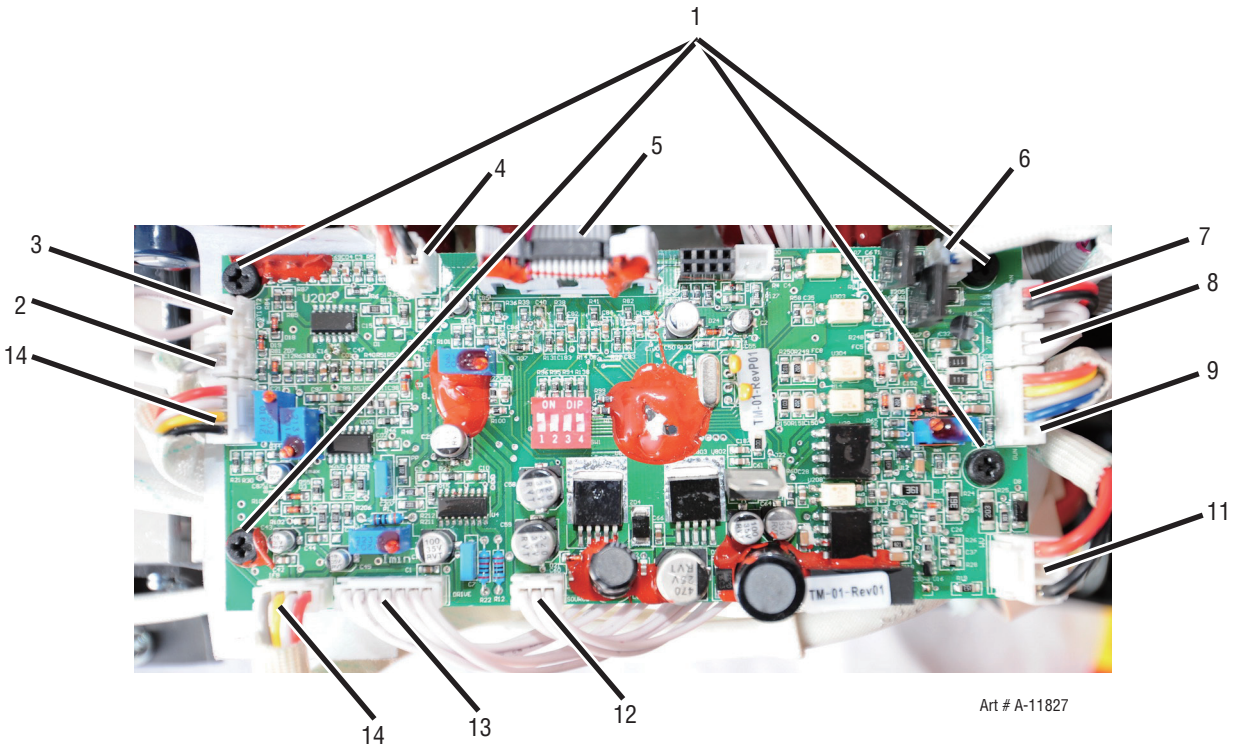


Figure 7-4: Control PCB Removal

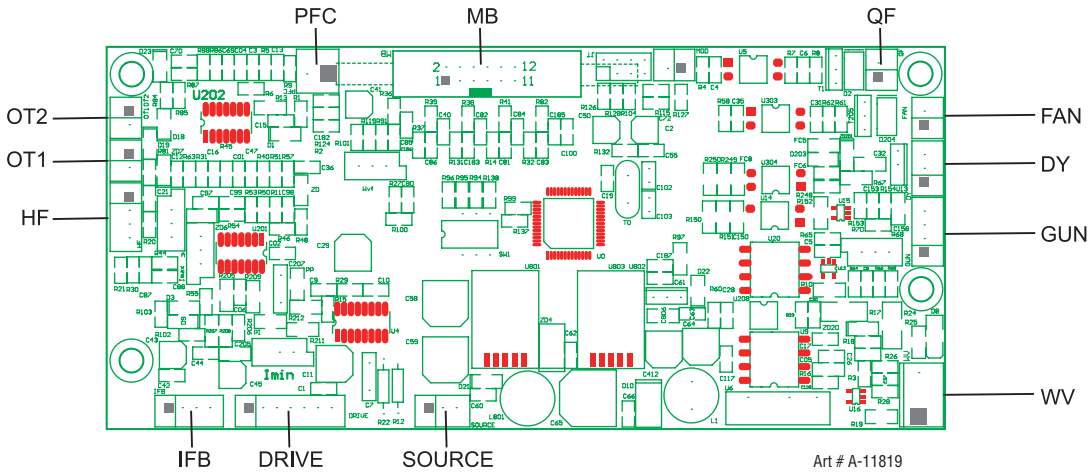


Figure 7-5: Control PCB

7.06 Rear Panel Removal

WARNING

Read and follow safety information in Section 6.04 before proceeding.

1. Remove the two screws at the bottom of Rear Panel.
2. Disconnect the ON/OFF switch wires from Inverter PCB.
3. Disconnect the ground harness from Inverter PCB.
4. Disconnect the gas hose from Rear Panel.

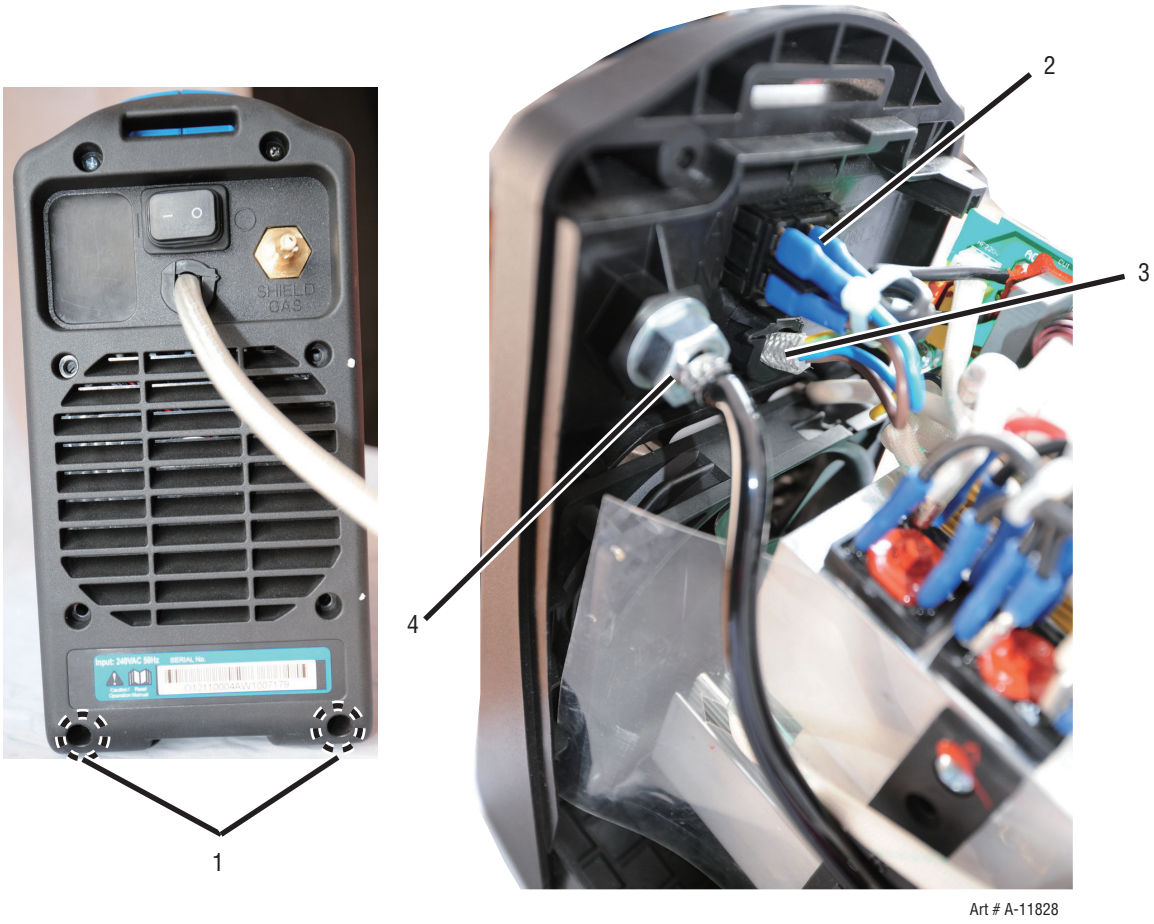


Figure 7-6: Rear Panel Removal

7.07 ON/ OFF Switch and Power Cord Removal

WARNING

Read and follow safety information in Section 6.04 before proceeding.

1. Disconnect the four wires from Rear Panel.
2. ON/ OFF Switch
3. ON/ OFF switch locking tabs

   Squeeze the locking tabs and push ON/ OFF switch out from Rear Panel.
4. Input Power Cord
5. Disconnect the ground harness from Rear Panel.

   Squeeze the locking tabs and pull out the Input Power Cord.
6. Remove the fan.

Figure 7-7: ON/ OFF Switch and Power Cord Removal

7.08 HF PCB Removal

WARNING

Read and follow safety information in Section 6.04 before proceeding.

1. Remove the 4 plastic umbrella-shape screws securing HF PCB.
2. Remove Ground harness from HF PCB.
2. Disconnect SOUHF harness from HF PCB.
3. Disconnect 110V/ 220V input harness from HF PCB.
4. Disconnect Coil harness from HF PCB.

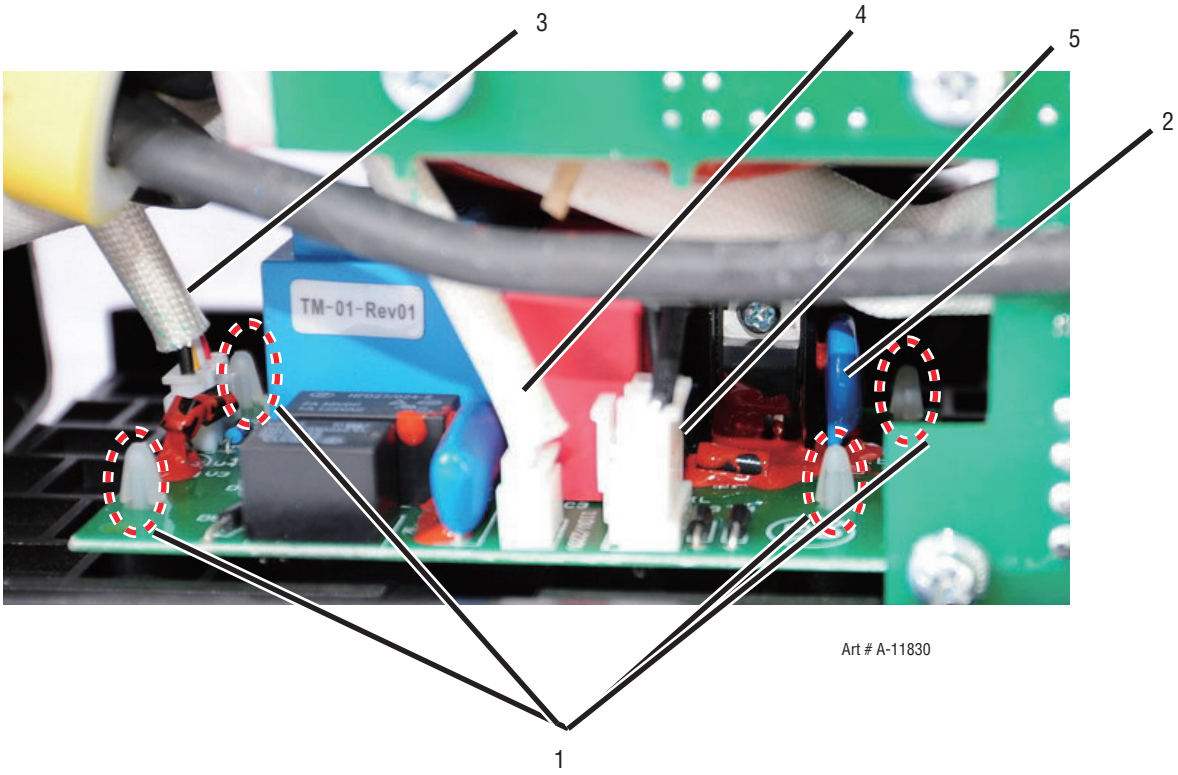


Figure 7-8: HF PCB Removal

7.09 Base Panel Removal

WARNING

Read and follow safety information in Section 6.04 before proceeding.

1. Inverter PCB.
2. Remove the four screws and remove Inverter PCB.
3. Remove Base Panel.

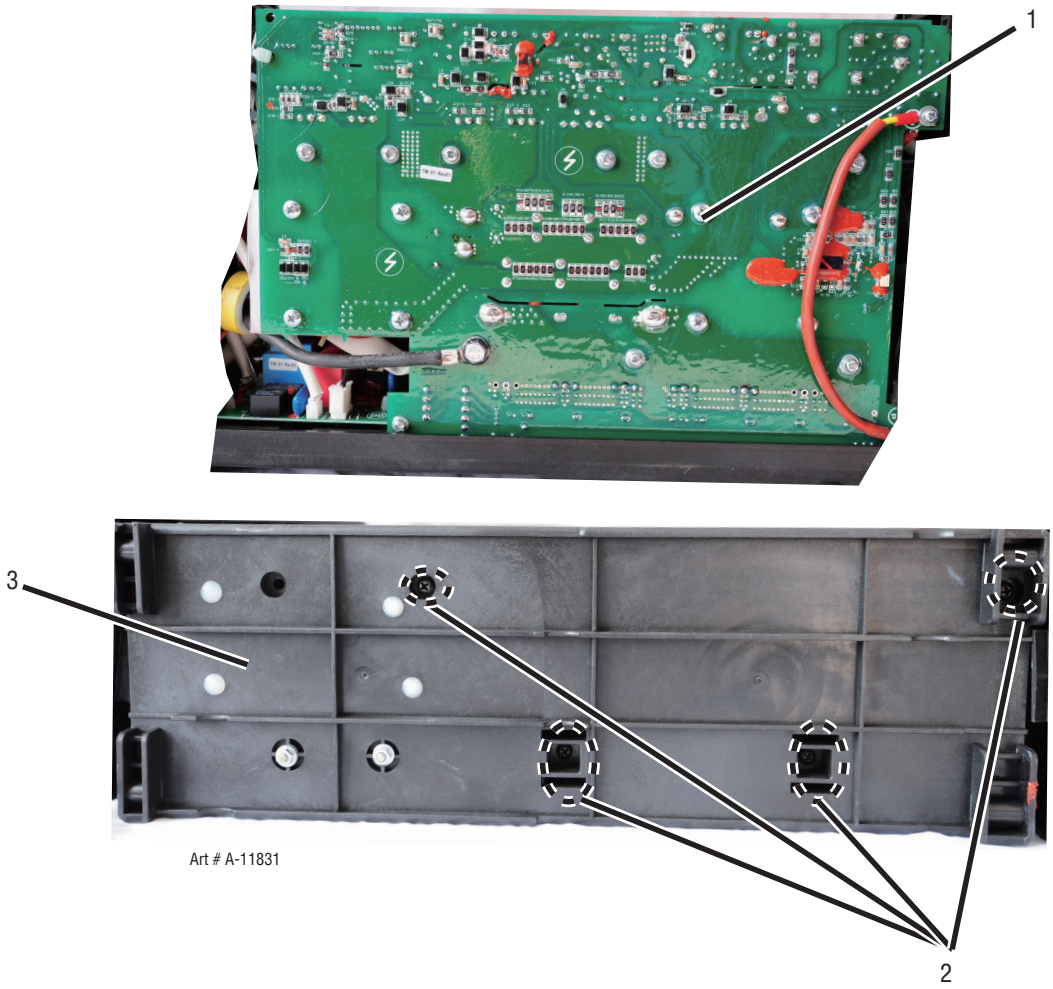


Figure 7-9: Base Panel Removal

SECTION 8:
ASSEMBLY PROCEDURE

8.01 Installing Base Panel

1. Base Panel
2. Secure HF PCB to Base Panel with four plastic umbrella-shape screws.
3. Secure Inverter PCB with the four screws.
4. Inverter PCB

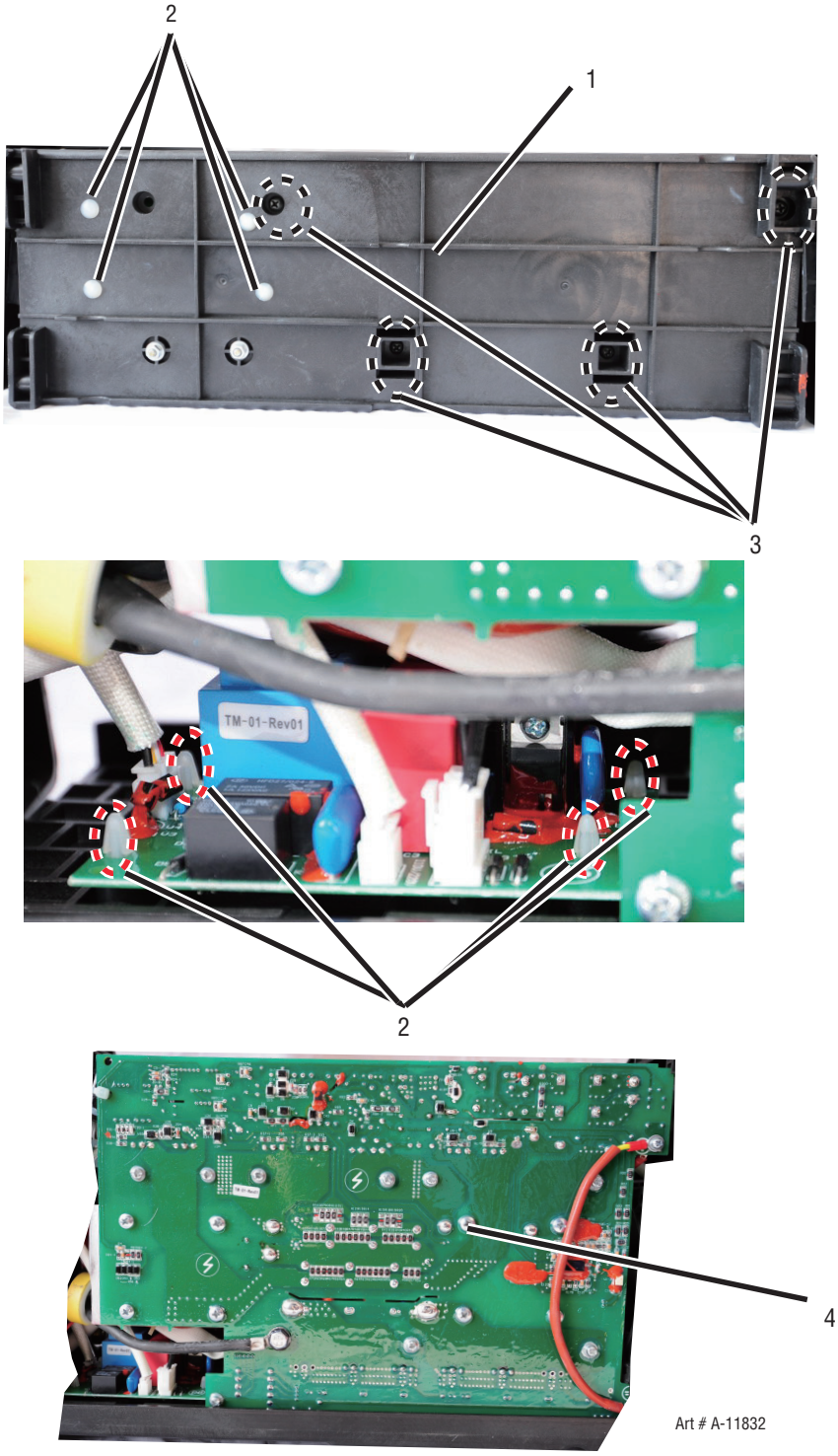


Figure 8-1: Installing Base Panel

8.02 Installing Rear Panel

1. Install ON/ OFF Switch.
2. Install Input Power Cord.
3. Reconnect the four wires to Rear Panel.
4. Reconnect Ground harness to Rear Panel.
5. Reconnect Gas Hose to Rear Panel.
6. Install Fan.
7. Reconnect the ON/OFF switch wires to Inverter PCB.
8. Reconnect Ground harness to Inverter PCB.
9. Tighten the two screws securing Rear Panel.

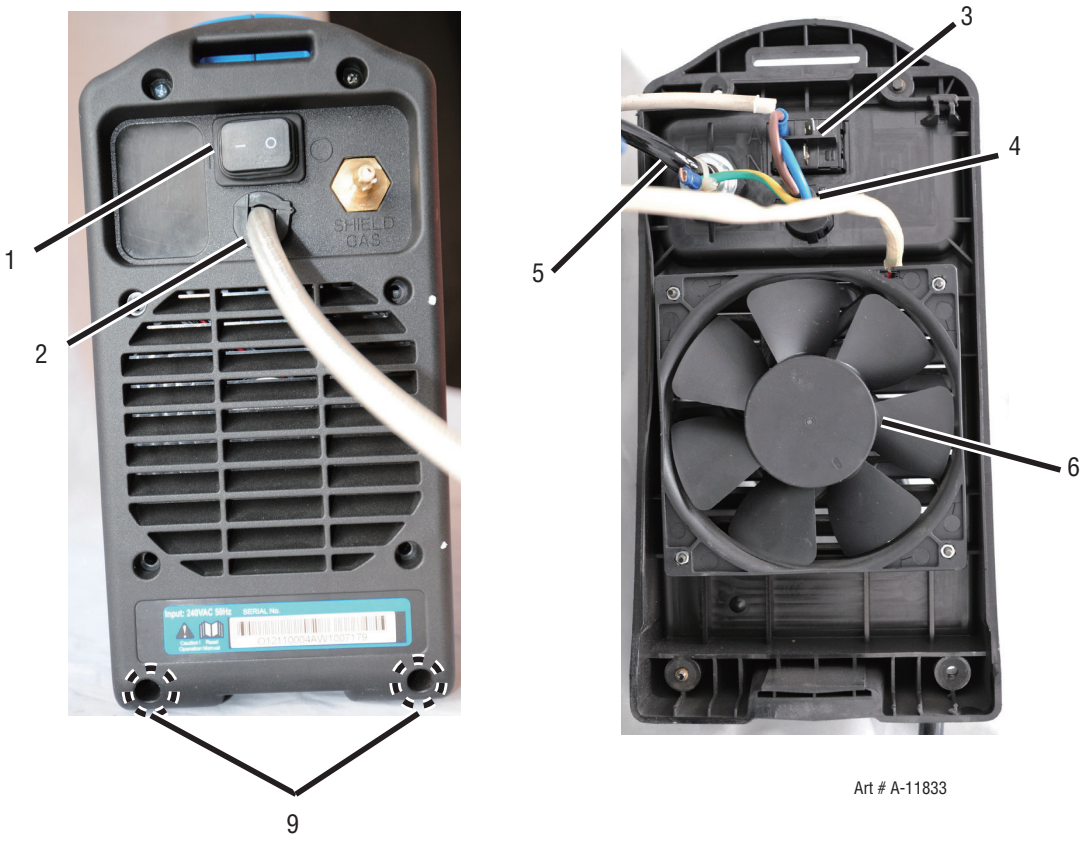


Figure 8-2: Installing Rear Panel

8.03 Installing Front Panel

1. Install the four screws and secure Display PCB to Front Panel.
2. Install the screw on the control knob.
3. Install the four screws on Front Panel.
4. Reconnect the gas hose.
5. Reconnect the gun harness to Inverter PCB.
6. Reconnect the MB harness to Display PCB. Make sure it is correctly installed with the levers in the locked position.
7. Tighten power supply output terminal bolts.
8. Install the two screws and secure Front Panel to Base Panel.

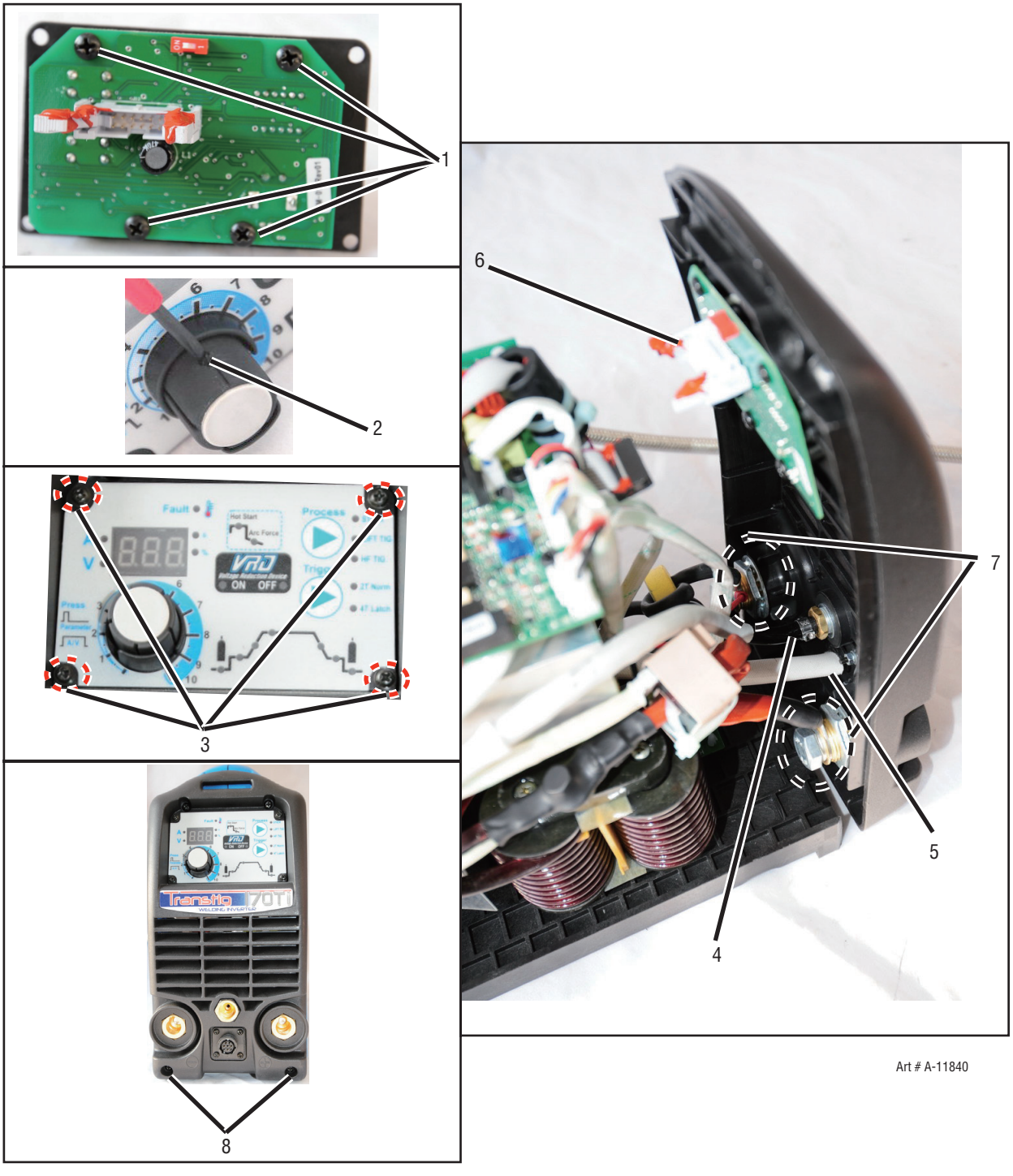


Figure 8-3: Installing Front Panel

8.04 Installing Control PCB

1. Install the four screws and secure Control PCB.
2. Plug OT1 harness into OT1 connector.
3. Plug OT2 harness into OT2 connector.
4. Plug PFC harness into PFC connector.
5. Plug MB harness into MB connector.
6. Plug QF harness into QF connector.
7. Plug FAN harness into FAN connector.
8. Plug DY harness into DY connector.
9. Plug GUN harness into GUN connector.
10. Plug WV harness into WV connector.
11. Plug SOURCE harness into SOURCE connector.
12. Plug DRIVE harness into DRIVE connector.
13. Plug IFB harness into IFB connector.
14. Plug HF harness into HF connector.
15. Verify harness connections with system schematic to ensure that all connections are correct.

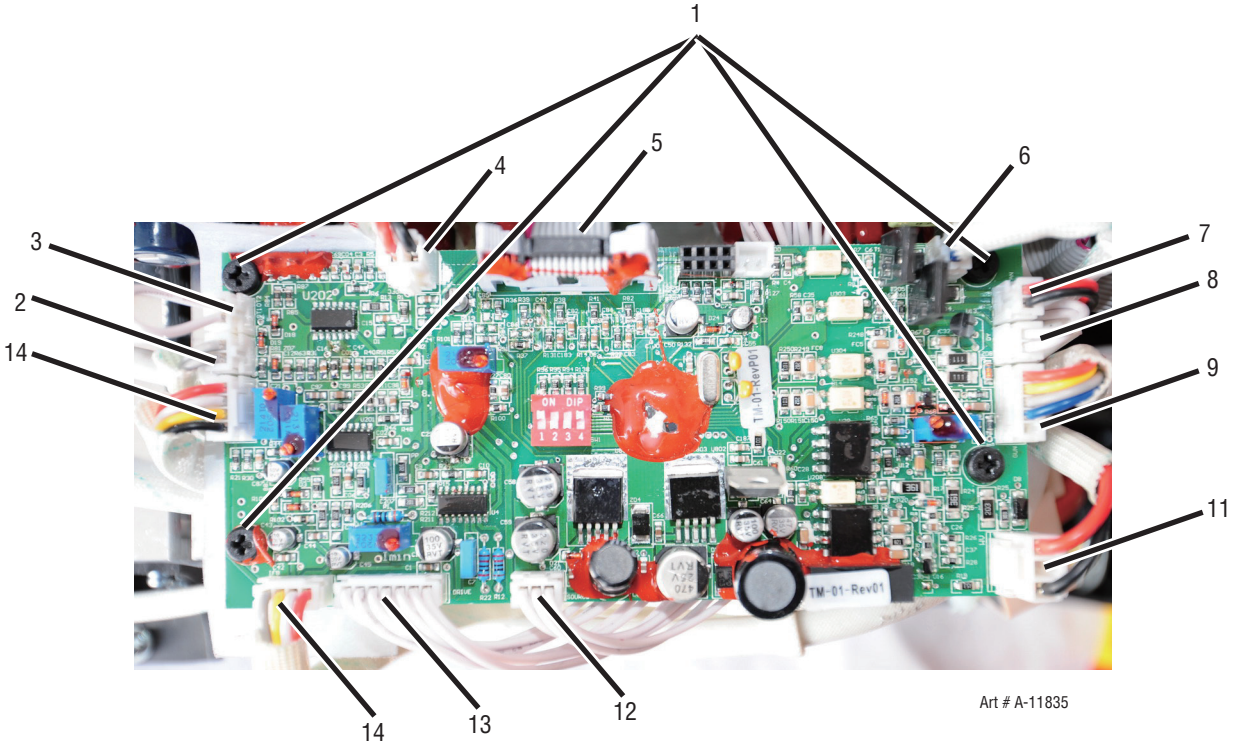


Figure 8-4: Installing Control PCB

8.05 Installing Cover Panel

1. Install Cover Panel.
2. Install the twelve screws securing Cover Panel., 8 on Cover Panel, 2 on Front Panel and 2 on Rear Panel.

Figure 8-5: Installing Cover Panel

Notes

SECTION 9:
KEY SPARE PARTS

9.01 Power Source

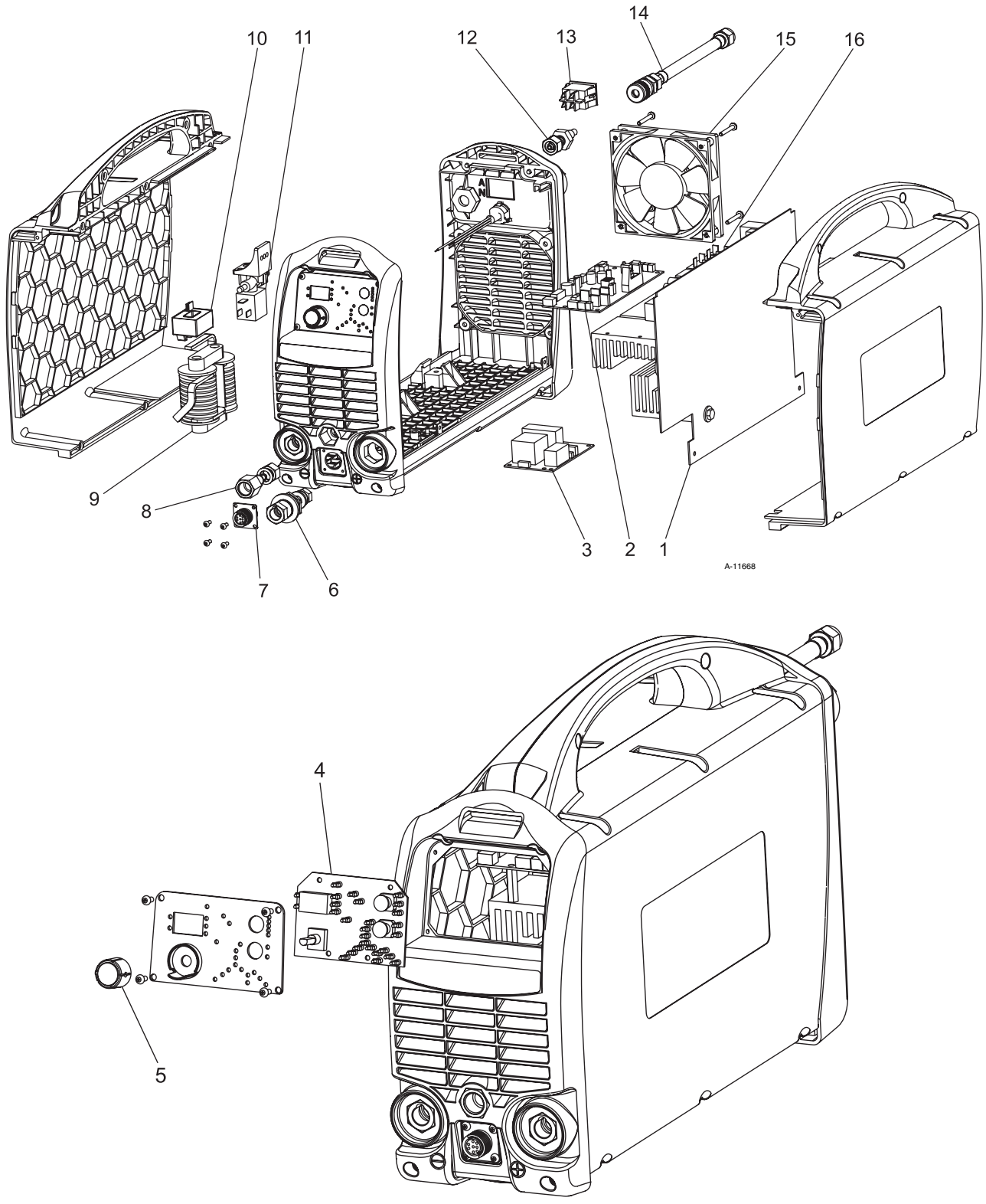


Figure 9-1

TRANSTIG 170Ti POWER SOURCE SPARE PARTS		
ITEM	**PART NUMBER**	**DESCRIPTION**
1	W7005815	PCB Power
2	W7005801	PCB Control
3	W7005802	PCB HF Generator
4	W7005803	PCB Front Panel (Display) 170Ti
5	W7005805	Knob Control
6	W7004909	Dinse Socket 50mm^2
7	W7005811	Control Socket 8 pin (Note that 8 pin control plug is part number UOA706900)
8	W7005812	Shielding Gas Outlet 5/8-18
9	W7005804	HF Coupling Coil Assembly
10	W7005814	CT Output
11	W7004908	Shielding Gas Solenoid Valve Assembly
12	W7005605	Shielding Gas Inlet Quick Connect
13	W7005813	Input Supply On/Off Switch
14	W7004913	Shielding Gas Hose Assembly
15	W7005806	Fan Assembly
16	W7003010	Input Rectifier (Shown mounted to PCB Power, item 1)
17	704461	Dinse Plug Male 50mm^2 (not shown)

Table 9-1

9.02 TIG Torch W4014604

TIG Torch W4014604 spare parts diagram

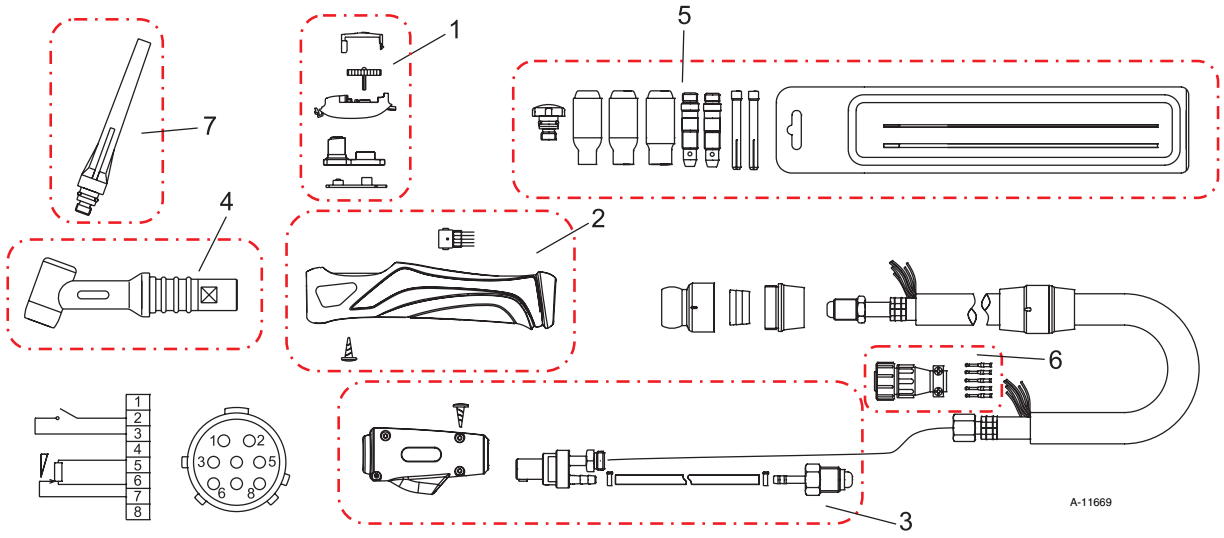


Figure 9-2

TIG TORCH SPARE PARTS		
ITEM	**PART NO.**	**DESCRIPTION**
1	W7005900	Trigger assembly for 26F torch
2	W7005901	Handle assembly for 26F torch
3	W7005902	Dinse 50mm for 26F torch
4	W7005903	Flex head for 26F torch
5	BGSAK2	Tig accessory Kit
6	UOA706900	Cable Plug 8 pin
7	BG57Y02/R	Back Cap (Long)

Table 9-2

9.03 Stick Electrode Holder with Trigger Switch 646761(where supplied)

Stick Electrode Holder with Trigger Switch 646761 spare parts diagram

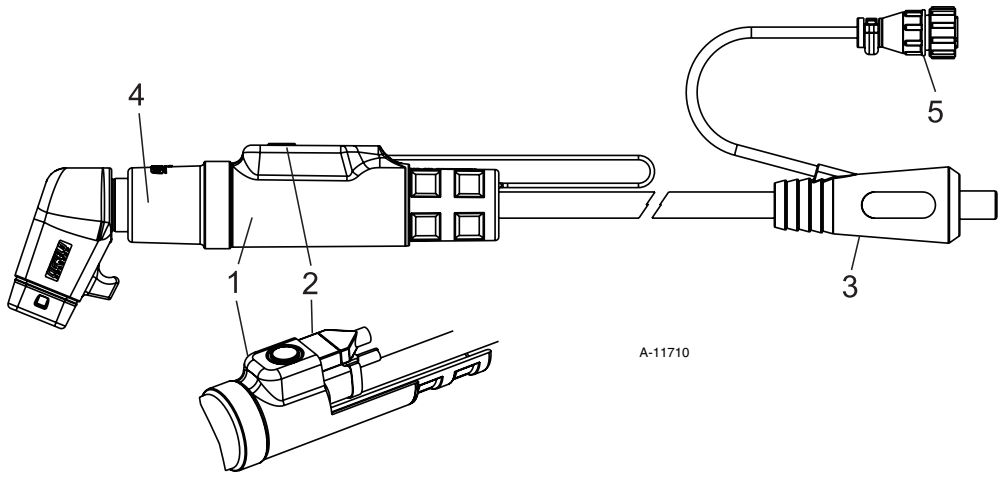


Figure 9-3

ELECTRODE HOLDER SPARE PARTS		
ITEM	**PART NO.**	**DESCRIPTION**
1	W7006000	Rubber boot for electrode holder switch
2	W7006001	Push Button Switch for electrode holder
3	W7006002	Dinse 50mm² for electrode holder
4	646162	400A electrode holder handle assembly
5	UOA706900	Control Plug 8 pin

Table 9-3

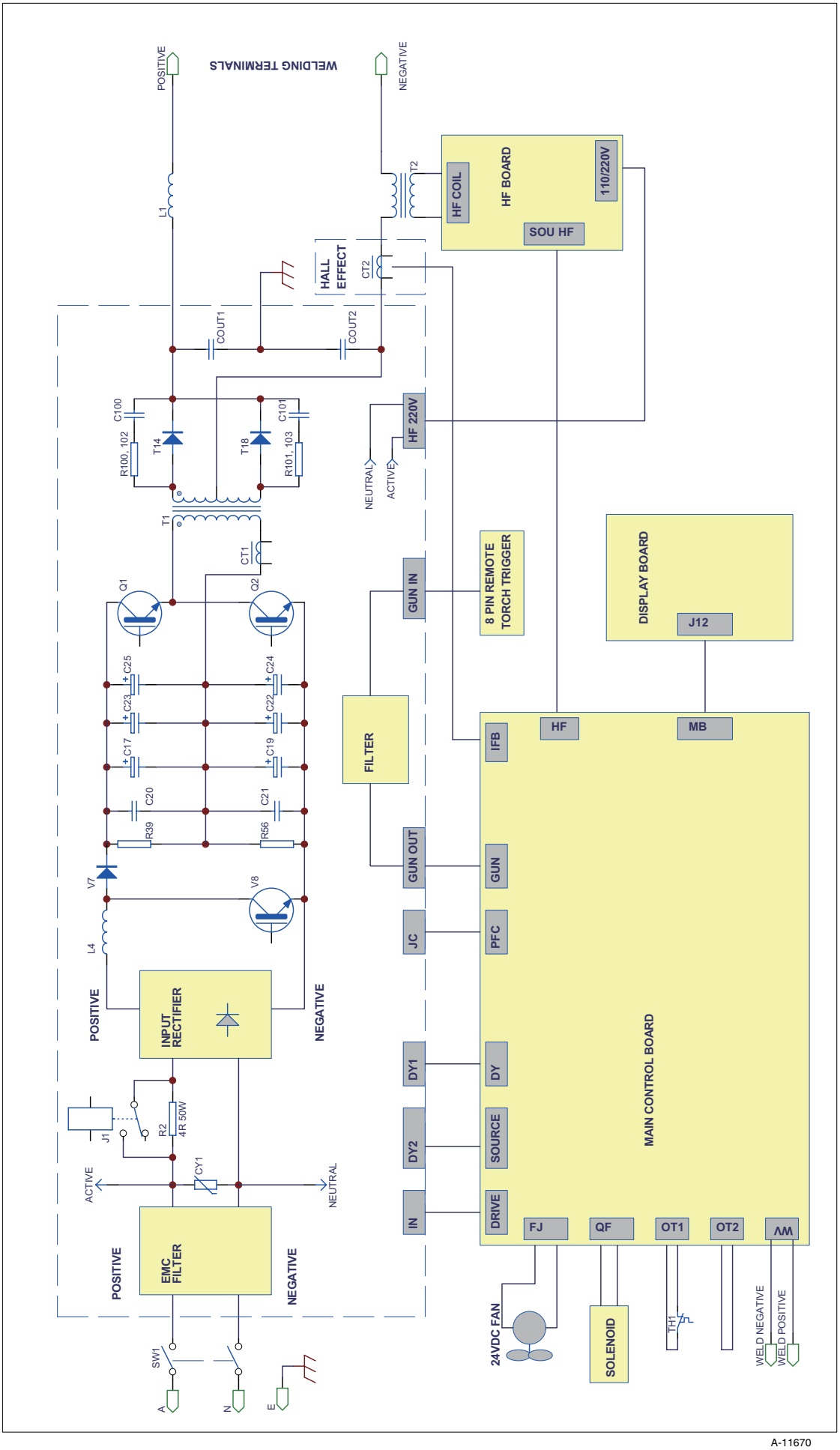
NOTE

The Welding cable with integrated control wires is not available as a separate spare part.

APPENDIX 1: OPTIONS AND ACCESSORIES

DESCRIPTION	PART NUMBER
TIG Torch 26V with 4m lead and remote control	W4014604
TIG Torch accessory kit	BGSAK2
Foot Control with 8m lead	W4015800
Electrode Holder & Work Lead Set 8m 400A 50mm² DINSE	646325
Electrode Holder with trigger switch and 4m lead	646761
50mm² Male DINSE cable connector	704461
Naka Measurement Gauge	646265
Shielding Gas Hose Assembly, 3M	W7004913

APPENDIX 2: TRANSTIG 170TI CIRCUIT DIAGRAM



A-11670

CIGWELD - LIMITED WARRANTY TERMS

LIMITED WARRANTY: CIGWELD Pty Ltd, A Victor Technologies Company, hereafter, “CIGWELD” warrants to customers of its authorized distributors hereafter “Purchaser” that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the CIGWELD products as stated below, CIGWELD shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with CIGWELD’s specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at CIGWELD’s sole option, of any components or parts of the product determined by CIGWELD to be defective.

CIGWELD MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: CIGWELD SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, SUCH AS, BUT NOT LIMITED TO, LOST PROFITS AND BUSINESS INTERRUPTION. The remedies of the Purchaser set forth herein are exclusive and the liability of CIGWELD with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by CIGWELD whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based. No employee, agent, or representative of CIGWELD is authorized to change this warranty in any way or grant any other warranty.

PURCHASER’S RIGHTS UNDER THIS WARRANTY ARE VOID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH IN CIGWELD’S SOLE JUDGEMENT MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY CIGWELD PRODUCT. PURCHASER’S RIGHTS UNDER THIS WARRANTY ARE VOID IF THE PRODUCT IS SOLD TO PURCHASER BY NON-AUTHORIZED PERSONS.

The warranty is effective for the time stated below beginning on the date that the authorized distributor delivers the products to the Purchaser. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date CIGWELD delivered the product to the authorized distributor.

TERMS OF WARRANTY – JANUARY 2013

1. The Trade Practices Act 1974 (Commonwealth) and similar State Territory legislation relating to the supply of goods and services, protects consumers' interests by ensuring that consumers are entitled in certain situations to the benefit of various conditions, warranties, guarantees, rights and remedies (including warranties as to merchantability and fitness for purpose) associated with the supply of goods and services. A consumer should seek legal advice as to the nature and extent of these protected interests. In some circumstances, the supplier of goods and services may legally stipulate that the said conditions, warranties, guarantees, rights and remedies are limited or entirely excluded. The warranties set out in Clause 2 shall be additional to any nonexcludable warranties to which the Customer may be entitled pursuant to any statute.

2. Subject to Clause 3. CIGWELD gives the following warranties to the Customer:

   Insofar as they are manufactured or imported by CIGWELD, goods will upon delivery be of merchantable quality and reasonably fit for the purpose for which they are supplied by CIGWELD.

   CIGWELD will repair or, at its option, replace those of the goods which, upon examination, are found by CIGWELD to be defective in workmanship and/or materials.

   CIGWELD reserves the right to request documented evidence of date of purchase.

3. The Warranty in Clause 2;

   Is conditional upon:

   The Customer notifying CIGWELD or our Accredited Distributor in writing of its claim within seven (7) days of becoming aware of the basis thereof, and at its own expense returning the goods which are the subject of the claim to CIGWELD or nominated Accredited Distributor/Accredited Service Provider. The goods being used in accordance with the Manufacturer's Operating Manuals, and under competent supervision.

   Does not apply to:

   Obsolete goods sold at auction, second-hand goods and prototype goods.

   Breakdown or malfunction caused by accident, misuse or normal wear and tear.

   Repairs or replacement made other than by CIGWELD or Accredited Service Providers, unless by prior arrangement with CIGWELD.

   Replacement parts or accessories which may affect product safety or performance and which are not manufactured, distributed or approved by CIGWELD.

4. CIGWELD declares that, to the extent permitted by law, it hereby limits its liability in respect of the supply of goods which are not of a kind ordinarily acquired for personal, domestic or household use or consumption to any one or more of the following (the choice of which shall be at the option of CIGWELD).

   The replacement of the goods or the supply of equivalent goods.

   The repair of goods.

   The payment of cost of replacing the goods or acquiring equivalent goods.

   The payment of the cost of having goods repaired.

5. Except as provided in Clauses 2 to 4 above, to the extent permitted by statute, CIGWELD hereby excludes all liability for any loss, damage, death or injury of any kind whatsoever occasioned to the Customer in respect of the supply of goods including direct, indirect, consequential or incidental loss, damage or injury of any kind.

WARRANTY SCHEDULE – JANUARY 2013

These warranty periods relate to the warranty conditions in clause 2. All warranty periods are from date of sale from the Accredited Distributor of the equipment. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date CIGWELD delivered the product to the Accredited Distributor. Unless otherwise stated the warranty period includes parts and labour. CIGWELD reserves the right to request documented evidence of date of purchase.

TRANSTIG170Ti POWER SOURCE	**WARRANTY PERIOD**	
	PARTS	**LABOUR**
Original main power magnetics.	3 Year	2 Year
Original main power rectifiers, printed circuit boards and power switch semiconductors.	2 Year	2 Year
All other circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans and electric motors.	1 Year	1 Year
ACCESSORIES	**WARRANTY PERIOD**	
TIG torch, electrode holder lead and work lead.	3 Months	
TIG torch consumable items.	NIL	
Gas regulator/flowmeter (excluding seat assembly, pressure gauges, elastomer seals and “O” rings).	1 Year	
Regulator seat assemblies and pressure gauges.	6 Months	
Elastomer seals and “O” rings used in the equipment.	3 Months	

Please note that the information detailed in this statement supersedes any prior published data produced by CIGWELD.

INNOVATION TO SHAPE THE WORLD

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CIGWELD Terms of Warranty - 2013

Effective 1st January 2013, all warranties against defects (also known as a manufacturer's warranty) supplied with goods or services must comply with the mandatory requirements in the new Australian Consumer Law and the Trade Practices (Australian Consumer Law) Amendment Regulations (2010) (No.1).

This Warranty Statement should be read in conjunction with the Warranty Schedule contained in the operating instructions of the product. This schedule contains the warranty period applicable to the product

Any claim under this warranty must be made within the warranty period which commences on the date of purchase of the product. To make a claim under the warranty, take the product (with proof of purchase from a Cigweld Accredited Seller) to the store where you purchased the product or contact Cigweld Customer Care 1300 654 674 for advice on your nearest Service Provider.

All costs associated with lodging the warranty claim including the return of goods to Cigweld or our Nominated Accredited Distributor / Accredited Service Provider are the responsibility of the consumer.

This warranty is given.
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Victoria, Australia, 3072
Phone: 1300 654 674
Email: enquiries@cigweld.com.au
Website: www.cigweld.com.au

This warranty is provided in addition to other rights and remedies you have under law:
Our goods come with guarantees which cannot be excluded under the Australian Consumer Law. You are entitled to replacement or refund for a major failure and to compensation for other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Failures due to incorrect use are not covered by this warranty and consumers are reminded to only use the product in accordance with the Operating Instruction supplied with the product. Additional copies of Operating Instructions are available from Cigweld Customer Care 1300 654 674 or the Website.

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